National Library of Canada
Acquisitions and Bibliographic Services Branch
395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale du Canada
Direction des acquisitions et des services bibliographiques
395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30, and subsequent amendments.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30, et ses amendements subséquents.

Canada

UNIVERSITY OF ALBERTA

Iannis Xenakis's *EVRYALI*: An Introduction to Structure, Meaning and Performance

by

Linda Marie Arsenault

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN
PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

DEPARTMENT OF MUSIC

EDMONTON, ALBERTA
SPRING, 1996

National Library
of Canada

Acquisitions and
Bibliographic Services Branch

395 Wellington Street
Ottawa, Ontario
K1A 0N4

Bibliothèque nationale
du Canada

Direction des acquisitions et
des services bibliographiques

395, rue Wellington
Ottawa (Ontario)
K1A 0N4

Your file Votre référence

Our file Notre référence

The author has granted an irrevocable non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of his/her thesis by any means and in any form or format, making this thesis available to interested persons.

L'auteur a accordé une licence irrévocable et non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de sa thèse de quelque manière et sous quelque forme que ce soit pour mettre des exemplaires de cette thèse à la disposition des personnes intéressées.

The author retains ownership of the copyright in his/her thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without his/her permission.

L'auteur conserve la propriété du droit d'auteur qui protège sa thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

ISBN 0-612-10664-0

Canada

UNIVERSITY OF ALBERTA

LIBRARY RELEASE FORM

Name of Author:	Linda Marie Arsenault
Title of Thesis:	Iannis Xenakis's *Evryali*: An Introduction to Structure, Meaning and Performance
Degree:	Master of Arts
Year this Degree Granted:	1996

Permission is hereby granted to the University of Alberta Library to reproduce single copies of this thesis and to lend or sell such copies for private, scholarly or scientific research purposes only.

The author reserves all other publication and other rights in association with the copyright in the thesis and, except as hereinbefore provided, neither the thesis nor any substantial portion thereof may be printed or otherwise reproduced in any material form whatever without the author's prior written permission.

Linda Marie Arsenault

3544 - 114 Street
Edmonton, Alberta
T6J 1L9

April 21, 1996

UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "Iannis Xenakis's *Evryali*: An Introduction to Structure, Meaning and Performance" submitted by Linda Marie Arsenault in partial fulfilment of the requirements for the degree of Master of Arts.

Brian L. Harris

B. Harris, Co-Supervisor

H. Bashaw, Co-Supervisor

M. Giesbrecht

M. Van de Pitte

April 18/96

For

Sister Rita Marie McLean, C.S.J., Dr. Ann Henderson-Nichol and the late Dr. Christopher Lewis, three extraordinary teachers who, often against long odds, believed in me and helped me to forge my own destiny. *Sine qua non.*

Abstract

Performance practice is not a novel issue. In the case of Iannis Xenakis's music the question of performance practice arises because the notes, as he has written them, are often considered to be beyond human physical execution. Preceded by a very brief sketch of Xenakis's background, this study focuses on the performance of one such work, a composition for piano entitled, *Evryali*.

Chapter I introduces *Evryali* in its various complex guises, first of all, as a musically-notated autograph score; secondly, as it was first conceived in its graphic format; and thirdly, as a published musical score. Chapter II, devoted to the essential Xenakian principle of "stochastic music," prepares the way for musical analysis.

Viewed largely from the standpoint of issues critical to the performer, Chapter III focuses on *Evryali* through identification of the prime individual musical components unique to this work; these are then viewed in the context of the overall musical itinerary of the piece. Chapter IV offers interpretative readings of the music.

Chapter V, a preface to Chapter VI, establishes the precedence for performance difficulties in Xenakis's compositions while Chapter VI, the heart of the matter, concentrates on various performance solutions based on the experiences of three world-renowned musicians.

Acknowledgements

It gives me great pleasure to begin my list of acknowledgements by being able to thank a living composer, Iannis Xenakis, for *Evryali*, an absolutely intriguing musical work which could well provide years of fascinating investigation.

I wish to thank musicians Marie-Françoise Bucquet, Claude Helffer and Roger Woodward for taking time from their otherwise hectic schedules to consult with me, first of all, in their own homes, and then across the miles by telephone, fax and post until the study was completed. Their faith in *Evryali* and their dedication to its execution have magnanimously provided the substance for the performance component of this thesis.

For generous financial support to realize the journey to Paris and London, I am indebted to members of the Ladies' Afternoon Musica Bella Society (LAMBS: Marlis Gunderson, Mary Hamilton, Ann Henderson-Nichol, Mary Ellen McDonald, Marie Nichols, Annie Ooraikul and Helen Parks), to Valerie Lineham, Jim Nichols and Constance Landi, and to the Faculty of Graduate Studies and Research, and the Vice-President (Research) of the University of Alberta for the J. Gordin Kaplan Graduate Student Award.

During the three-month writing process of the thesis, the suggestions of my co-supervisors have been invaluable: Dr. Brian Harris has been a vigilant, meticulous reader who constantly offered guidance, encouragement and

insights; Dr. Howard Bashaw directed the writing of the analytical Chapter III. I am grateful to Dr. Marnie Giesbrecht and Dr. Margaret Van de Pitte who, despite the pressure of time constraints, graciously undertook the roles of secondary readers.

Throughout the gestation period, Ann Henderson-Nichol has been a mainstay of strength, always available for stimulating discussion and the deft wielding of an editorial pencil. Jim Nichols has responded skilfully and unstintingly to frantic computer-related distress calls, solving time-consuming problems with patience and good humour. Lorraine Stocking's experienced hand brought text and graphics together for the final product.

The life of a student exacts long hours of isolation, which necessarily encroach upon commitments to family and friends. Although many have not understood the thrill and the joy of my work they have, nevertheless, patiently endured my obsession.

Table of Contents

Chapter	Page
Introduction	1
I The Score	11
II The Stochastic Principle	19
III Musical Analysis	25
IV Readings of *Evryali*	62
V *A Propos* Performance	74
VI Performance of *Evryali*	78
Conclusion	118
Works Consulted	125

List of Photographs

Page

Marie-Françoise Bucquet with Xenakis 13

Roger Woodward with Xenakis 105

Claude Helffer with Xenakis 114

List of Graphics

Grand Staff Reduction of *Evryali* 26-27

Graphic Representation of *Evryali* on X-Y Axis 45-50

Overview of Form of *Evryali* 54

List of Reproductions

Photocopy of Page 3 of Autograph Manuscript of *Evryali* . . . . . Back Pocket

Photocopy of Page 2 of Autograph Sketch of *Evryali* 15

List of Musical Examples

Example Page

1. Measures 47 to 60 of Grand Staff Reduction 29
2. Measures 75 to 87 of Grand Staff Reduction 33
3. Measures 102 to 109 of Grand Staff Reduction 34
4. Measures 61 to 64 of Grand Staff Reduction 36
5. Measures 87 to 92 of Grand Staff Reduction 37
6. Measures 1 to 4 of Salabert score 55
7. Measures 81 to 82 of Salabert score 82
8. Bucquet's concept for practising leaps 84
9. Measures 355 to 361 of piano part from *Synaphai* 87
10. Measures 71 to 75 from *Nuits* 88
11. Measures 80 to 81 of Salabert score 89
12. Measures 61 to 64 of Salabert score 92
13. Measure 158 of Salabert score 97
14. Measure 135 of Salabert score 99
15. Woodward's working-note example for execution of first beat of measure 135 99

Introduction

The music of Iannis Xenakis embraces a plurality of ideas, rooted principally in architecture, mathematics, philosophy, and history. Beginning with *Metastaseis*[1] in 1953-54, he has composed over one hundred major works, for all combinations of instruments. His compositional interests and techniques cover an enormous range of possibilities from the use of architectural principles, stochastic music, game theory, symbolic music, set theory, theory of sieves, group theory, total theatre, spatial music and arborescences to electronic and computer technology.

The majority of Xenakis's compositions cannot be obviously identified by one compositional principle, because they generally employ a combination of the compositional techniques just cited. *Metastaseis*, for example, utilizes architectural, serial and stochastic principles to introduce mass sound events in an innovative way; in *Pithoprakta* (1955-56), mass events are generated by stochastic means; *Duel* (1959) is a game between two orchestras based on game theory, stochastic music and mathematical theories of control mechanisms.

Nouritza Matossian has published the sole biography of Xenakis; in it

---

[1] The correct spelling of *Metastaseis* is cause for confusion. The musician Claude Helffer pointed out to me in his letter of March 26, 1996, "*l'oeuvre d'orchestre, publiée chez Schott, s'appelle Metastasis*" ("the orchestral work, published by Schott, calls it *Metastasis*" [all French translations in this thesis are my own]). All recordings adopt the spelling by Schott, Xenakis's first publisher. However, the present study, in keeping with current library usage, follows the Boosey & Hawkes 1967 facsimilie edition of the score, which establishes the spelling *Metastaseis*.

she discusses not only Xenakis's biographical details, but also his philosophies, his theories and his compositions.[2] As her text unfolds, the reader is taken into Xenakis's creative laboratory, where experimentation is a continuous process: Xenakis begins with an analytical idea, works out the details and presents a finished product. If the end result does not suit him, he does not rework it in the Beethovenian sense; rather, any deficiencies provide the galvanising force for further experimentation in the next piece. Matossian states the case categorically:

> He consciously detaches himself from his brain-children, casting out the young from the nest in order to make room for others. Apart from the theatre suites and technical corrections to new works, not one work revised, reworked, adapted in a new version comes to mind. He moves on to the next problem or the problem in a different light, a new instrumentation, a different angle. The sustaining impetus is the process not the result.[3]

Xenakis is a composer whose music, in spite of its scientific genesis, is steeped in his own life's experiences, a life which may be considered unusual by most standards. For an understanding of Xenakis's music, whether the analytical objective be mathematical, philosophical or historical, a basic familiarity with the background from which he emerged is absolutely critical.[4]

---

[2] Nouritza Matossian, *Xenakis* (London: Kahn & Averill, 1990), hereafter cited as Matossian.

[3] Matossian, 243.

[4] I am profoundly grateful to Matossian for her authoritative work. Her monograph, written over a period of ten years in close contact with Xenakis, reveals fascinating and illuminating information hitherto unavailable; it is an

Iannis Xenakis, of Greek parentage, was born in Romania on May 29, 1922.[5] His father, Clearchos, was a man of abstract and philosophical bent, particularly interested in theology. However, himself the eldest of twelve siblings, Clearchos set aside his prime interests in order to contribute to the family finances, eventually becoming a prosperous businessman. He married Photini Pavlou, a woman who demonstrated an aptitude for languages and piano performance. Three sons were born to them, of whom Iannis was the eldest. Xenakis's mother died when he was five years old.

Receiving his elementary education at the Anargyrios and Koryalenios School on the Greek island of Spetzai, Xenakis was drawn to classical Greek philosophy and literature, whereby he "began to erect the intellectual scaffolding upon which he would build a lifetime's work of research and creative expression."[6] Xenakis's secondary education began in Athens in 1938 with two failed attempts to pass the rigorous entrance examinations to the Athens Polytechnic; he was successful in 1940 but, because of interruptions caused by the war, it took him seven years to complete his engineering studies. Up to 1938 Xenakis was not particularly predisposed towards music, so it comes as something of a surprise that at this time he began to explore

---

essential concomitant of this study and serves as the definitive source for all biographical material.

[5] Matossian, 13, states that Xenakis's "date of birth is usually given as 29 May 1922 although some relatives believe he was born in 1921 for his birth certificate was lost during the war."

[6] Matossian, 16.

music seriously by taking piano lessons, which he subsequently abandoned to pursue harmony and counterpoint.

During the Italian and German occupation of Greece, Xenakis, together with other students, became active in the Greek Resistance; for his Resistance activities over a six-year period, he was imprisoned by the Italians, the Germans and then, after World War II, by the British. On New Years Eve, 1945, during a day's fighting against the British, a violent explosion erupted in the house where Xenakis was located. Among the other inhabitants who perished in the blast, Xenakis was left for dead; had it not been for his father's indefatigable efforts to find and rescue him, he probably would have died.

After a three-month hospital stay, Xenakis confronted his war-torn world with a vicious physical testimony of his activities: the left side of his face was badly scarred and he had lost his left eye. Undeterred by his experience, however, Xenakis maintained his Resistance efforts, aligning himself with the Communist Party fighting for an independent Greece. By 1946 he was forced to go underground; in 1947, he fled from Greece and managed to enter France illegally.

Two fortunate events occurred in Paris which were to shape Xenakis's musical destiny: the first was his employment by the world-renowned architect, Le Corbusier; and the second was his meeting with Olivier Messiaen. Although he began his engineering career in Le Corbusier's firm as one of forty engineers engaged in carrying out routine structural calculations for slabs, floors and columns of various designs, Xenakis's work was soon brought

to Le Corbusier's attention. At that time architects were battling a recurrent engineering problem, namely, the necessity to use aesthetically unsightly columns to support free-standing concrete platforms; by changing the design, Xenakis demonstrated that the columns could be eliminated. Thereafter, he was given duties calling for greater responsibility and creativity.

Architecture and music have a long history of discernible interaction. Friedrich von Schelling epitomised this mutual attraction and influence in his aphorism that architecture is "music in space, as it were a frozen music."[7] One of Xenakis's first demonstrations of this intimate union between architecture and music was realised in the design of the Couvent de St. Marie de la Tourette, a Dominican monastery overlooking the town of Eveux, not far from Lyons. For this structure Xenakis, as principal architect, incorporated an idea which Le Corbusier had learned from a project in Chandigarh, India, that of using glass to build transparent walls. For the west façade of the monastery which overlooks the town, Xenakis fused the use of glass with the musical concept of polyphony, resulting in what Le Corbusier referred to as "musical

---

[7] Friedrich von Schelling, *Philosophie der Kunst* (1829), 576. Other noteworthy allusions to the relationship between architecture and music include Madame de Staël's image that "*La vue d'un tel monument est comme une musique continuelle et fixée*" ("the sight of such a monument is like a continuous and stationary music"), *Corinne* (1807), Bk. IV, Ch. 3; and Goethe's words in a letter to Eckermann on March 23, 1829: "I call architecture frozen music." Expanding the notion to include all of the arts, Walter Pater, the great art historian of the late Nineteenth Century declared, "All art constantly aspires towards the condition of music," in in *The Renaissance* (1893) in the section "The School of Giorgione."

screens of glass."[8] In her monograph Matossian includes both a sketch and two photographs of the monastery, as well as a discussion of many of the other musical elements incorporated by Xenakis into the design.[9]

The name of Iannis Xenakis will be forever linked with the Philips Pavillion at the 1958 Brussels World Fair. In that building, Xenakis actually used the score of his composition, *Metastaseis*, to formulate the architectural design of the Pavillion.[10] And it was this stunningly attractive design which led to the rift and eventual separation between Xenakis and Le Corbusier: originally Le Corbusier took full credit for the design and it was only later, under duress, that he allowed Xenakis's name to be included beside his as "co-designer" of the Pavillion.[11] Xenakis, embittered by the experience, continued to work for Le Corbusier until August, 1959; when he arrived at work one morning he discovered that the locks had been changed and a letter of dismissal awaited him. Later, Le Corbusier reconsidered his decision and invited Xenakis to return to the firm, but there was no turning back for Xenakis.

---

[8] Matossian, 66.

[9] Matossian, 65-73.

[10] In Matossian, 112-17, some of the sketches of *Metastaseis*, together with their musical and architectural realizations, are shown. This unique manner of compositional creativity, both musical and architectural, is described in detail in Iannis Xenakis, *Formalized Music: Thought and Mathematics in Composition* (Stuyvesant, New york: Pendragon Press, 1992), 5-12, hereafter cited as *Formalized Music*.

[11] Matossian, 121.

When he had arrived in Paris in 1947, Xenakis had attempted to study with Arthur Honegger and Darius Milhaud, but these forays into musical instruction proved futile for Xenakis, who defended parallel fifths and octaves, and whose "notebooks reveal an uncompromising refusal to accept what he considered unimportant."[12] By 1950, Xenakis found himself "already 28 years old, with little technical experience of composition and a poor, highly eclectic background in music history."[13] By an ironic twist, it was Le Corbusier who suggested to Xenakis that he meet Olivier Messiaen; the meeting took place in 1951: Xenakis "must have been struck by the man's kind, modest and gentle manner. It must have been encouraging to the young man who was beginning to despair of finding a path to composition."[14]

Serialism was heartily embraced by young composers such as Jean Barraqué, Pierre Boulez, Luciano Berio and Karl Heinz Stockhausen, who made up Messiaen's group, *La Jeune France.* Xenakis, who attended Messiaen's meetings regularly in 1952, was introduced to serialism, including the integral form of the approach, which involves the application of serial methods to all components within a musical composition. He did, in fact, incorporate serialism in *Metastaseis,* but having undergone "profound disillusionment with the limitations of serialism based on his own experience with *Metastaseis* . . . he

---

[12] Matossian, 38.

[13] Matossian, 47.

[14] Matossian, 48.

published his very first article on music, an attack on serial music."[15] In accepting Messiaen's encouragement and advice to apply his understanding of architecture and special mathematics to his music, Xenakis effectively cut himself off from the serialists. Thus, "an identity of approach to architecture and music"[16] and the fusion of scientific architectural and musical concepts within one intellectual framework are what originally identified his work and rendered it unique.

In 1959 Xenakis began writing a book providing explicit explanations for the theoretical basis of his works. Portions from the book were originally published in *Gravesaner Blätter*, but the book made its first appearance as a monograph entitled *Musiques Formelles* in 1963. The English edition, *Formalized Music: Thought and Mathematics in Music*, was published in 1971; the 1992 edition contains five additional chapters and more appendices.[17] In essence, this document reveals the complex algebraic operations by which Xenakis combines scientific theories in musical applications. Although much in this text would most likely prove difficult, if not inaccessible, to those lacking mathematical specialization, a great deal may be gleaned from Xenakis's architectural drawings, charts and sketches and their relationship to the musical excerpts reproduced from his scores. Furthermore, this publication

---

[15] Matossian, 84.

[16] Matossian, 55.

[17] *Formalized Music*, iv.

represents a rich and essential source of Xenakian thought processes including, for example, his views on time and history, as well as his philosophy of music.

In 1976 the French degree of "*Doctorat d'État*" was awarded to Xenakis. This is not an honorary degree, but rather one based on the defence of previously published theoretical and creative material. His defence, a five-hour session with a selected jury, took place on May 18, 1976. Bernard Teyssèdre, Professor of Aesthetics at the University of Paris-Sorbonne, presided over an eminent cast of jurors which included Olivier Messiaen, Michel Ragon, Olivier Revault d'Allonnes and Michel Serres. The transcription of Xenakis's defence, made from tape recordings and translated into English, has been published under the title, *Arts/Sciences: Alloys*.[18]

Perhaps as a consequence of the numerous scientific and mathematical components which invest Xenakis's music, some of his works seem to defy accurate performance.[19] Thus, the performance practice of certain compositions raises searching questions: can the notes of the score, as penned by Xenakis, be physically executed by an ordinary mortal? if it is not possible to articulate all the notes, how does a performer achieve an aesthetically-satisfying performance? what are the motivating forces for the interpreter in

---

[18] *Arts/Sciences: Alloys. The Thesis Defense of Iannis Xenakis before Olivier Messiaen, Michel Ragon, Olivier Revault d'Allonnes, Michel Serres and Bernard Teyssèdre*, tr. Sharon Kanach (New York: Pendragon, 1985).

[19] See, for example, Pierre Boulez's letter to Xenakis in Matossian, 178; Paul Griffiths, *Modern Music* (London: Dent, 1981), 236, hereafter cited as Griffiths; and Peter Hill, "Xenakis and the Performer," *Tempo* 112 (1975), 17-22, hereafter cited as Hill.

making aesthetic choices--are they premised, for example, on stochastic principles, on aural effect? or are they determined by some other musical consideration?

Evryali is an excellent example of just such a composition.

Chapter I

"*Evryali* pulsates with life, with something unleashed; it is the most wonderful piano piece written this century."[20] These words, articulated by the eminent Australian pianist/composer, Roger Woodward, serve to throw into relief the status which *Evryali* has enjoyed among prominent pianists of avant-garde works of the Western classical repertoire in the last quarter of the Twentieth Century. Juxtaposed to this is the passionate outcry from the celebrated French pianist, Marie-Françoise Bucquet, to whom *Evryali* is dedicated: "*Il y a eu des périodes, je peux l'avouver, où je détestais* Evryali, *la trouvant trop brillante . . . .*"[21] This sentiment is of equal import for, at the very least, it highlights the great challenges involved in the composition. The dangerous responsibility of the performer, the enduring fascination, the struggle and the conquest, the physical test of Olympian proportion, the slaying of the Gorgon: these are the kind of responses which *Evryali* summons from its interpreters. What kind of music, what compositional force elicits such challenge, awe and high praise?

---

[20] Interview with Roger Woodward at his home in London, England, on January 3, 1996, hereafter cited as Woodward. Subsequent to our meeting Woodward has received an honorary Doctorate of Music from the University of Sydney and has been appointed Visiting Professor of Music at that institution.

[21] "There have been times, I can assure you, when I detested *Evryali*, finding it too brilliant . . . ." Marie-Françoise Bucquet, "Sur *Evryali*" in *Regards sur Iannis Xenakis*, ed. Hugues Gerhards (Paris: Éditions Stock, 1981), 225, hereafter cited as Bucquet.

Xenakis composed *Evryali* in Corsica in the summer of 1973, in his converted farmhouse, isolated in the middle of a maquis surrounded by the sea.[22] In her essay entitled, "Sur *Evryali*," Bucquet recalls her reaction when Xenakis first presented her with the score:

> When he brought me the manuscript of *Evryali* it was a long roll of cardboard from which came six sheets which immediately refused to stay on my desk. Their size, 60 cm high by 50 cm wide, offered to the eye a terrifying perspective of thirty-five systems (a standard score has rarely more than ten to a page). And then Xenakis's writing, that miniscule calligraphy . . . Contrary to what one could believe, it is not the ears or the fingers which are afraid, but the eyes. I still remember my panic at this whirlwind of unaccustomed elements and my stunned reaction at the sight of these lines, swollen and menacing, which sometimes covered almost the totality of the piano simultaneously. I really believed I would lose my footing and be tumbled by the waves. It is rare that the visual power of a composition is so strong . . . On the day of my first meeting with *Evryali* when I dared to show my terror, Xenakis, albeit gently and naturally, asked me to go and look for a long knife for him. Then, with precise, calm gestures, he folded each page in half and then cut it: I then found myself with a dozen manageable sheets and I had only half the amount of fear. It should be said that the re-copied printed text, from which I play now, never had such power over me; it is a pity for future interpreters that they could not have access to the manuscript.[23]

It is indeed a rare privilege for a musician to view the manuscript of *Evryali* in its original size and with Xenakis's "miniscule calligraphy," as

---

[22] Bucquet, 219.

[23] Bucquet, 220-21.

Bucquet describes it. At one of our early meetings she indicated that the original manuscript was most likely in Xenakis's safety deposit box. Imagine the surprise, the thrill and the excitement when she produced, as if by magic, photocopies of that manuscript in its full glory (terror) before it had been subjected to the knife--and then graciously presented me with one of those pages![24] With Xenakis's sanction, a photocopy of page 3 of the infamous original six pages is reproduced in the back-cover pocket. Although this photocopy replicates the manuscript in its original size and format to convey to the reader something of the alarming sight which confronted Bucquet when she first unrolled the score, the enormity of the total impact is, of course, lost by the absence of the other five pages.

Bucquet and Xenakis with the rolled sheets of the manuscript of *Evryali*.

[24] Interview with Marie-Françoise Bucquet in her Paris home, December 15, 1995.

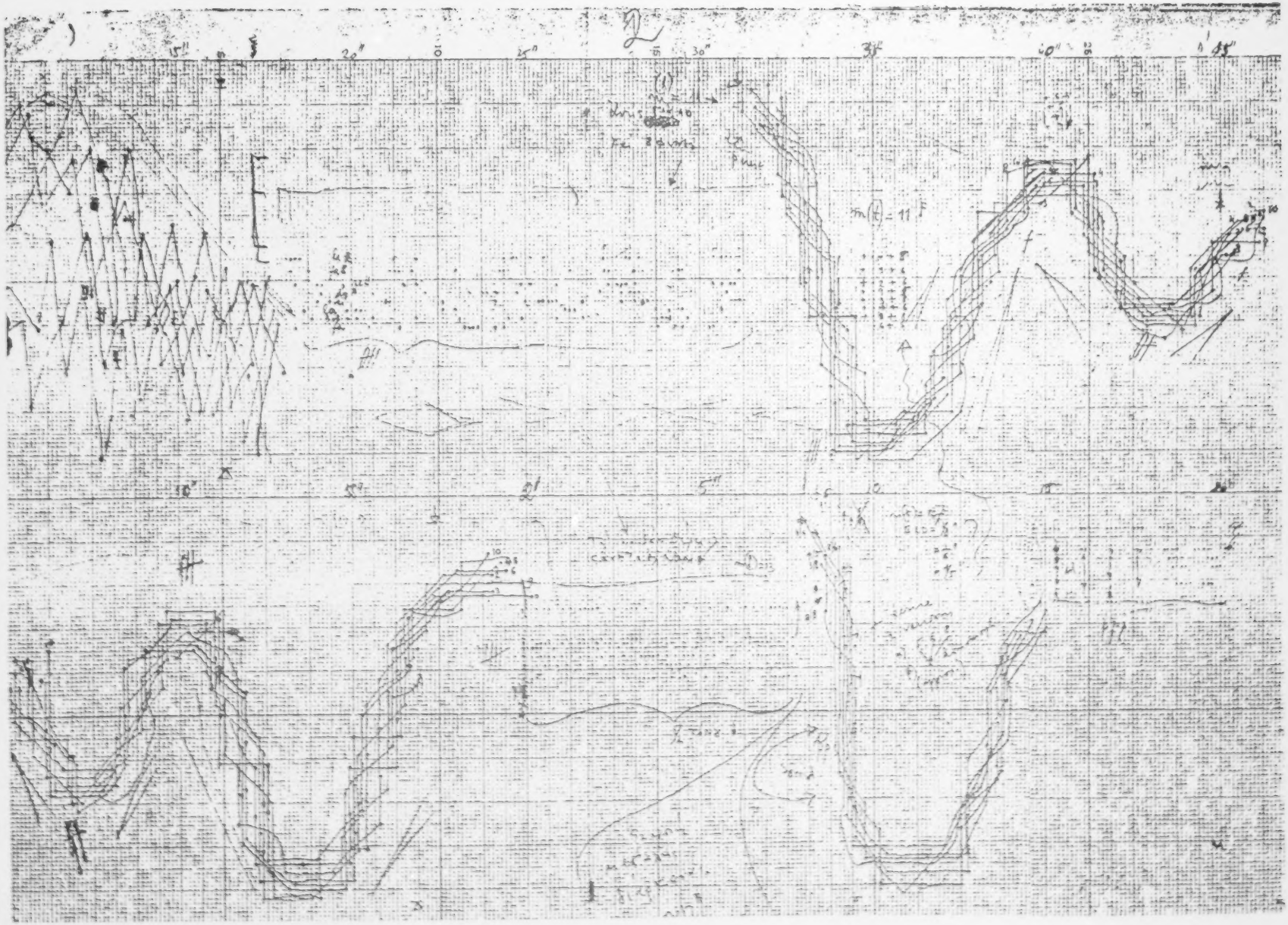
According to Bucquet, the embryonic stage of all of Xenakis's works is in graphic form, as part of the creative process prior to transcription to traditional notation.[25] *Evryali* is no exception: it made its first appearance as a series of twenty-four pages of complicated dots and lines, all drawn out on graph paper, requiring conversion into traditional musical notation.[26] Another fascinating treasure given to me by Bucquet and reproduced with Xenakis's permission, is the intriguing sketch on page 15. This sketch, in Xenakis's hand, is the graph revealing the creative process and the technical method of his compositional procedure for at least a small portion of *Evryali*. In this instance, the pitches (shown as dots) are plotted against time (shown in increments of five seconds). As inconceivable as it may seem to a non-mathematician, the sketch is designed to articulate precisely the sounds Xenakis hears and wishes to reproduce, as the placement and movement of the pitches, the dynamic markings and the twelve seconds of silence indicate.

In *Formalized Music* Xenakis expounds upon the interrelationships of

---

[25] Interview with Bucquet, December 15, 1995. In her discussion concerning *Pithoprakta*, Matossian, 106, states that Xenakis converted mathematical figures into musical notation; in her book she has included five sketches from four different compositions (also found in *Formalized Music*). Nonetheless, it came as a revelation to know that all of Xenakis's compositions are first generated in graphic form.

[26] The fact that *Evryali* originally consisted of twenty-four pages of sketches was gleaned from Bucquet. From the amount of "music" presented in the sketch on page 15, roughly measures 36 to 70, it is clear that this one page represents approximately fifteen per cent of the total score. For this reason, one wonders if there were fewer pages of sketches in total, perhaps only ten; or then, whether the nature of the mathematical formulations used after measure 70 required greater space for fewer measures?



mathematics, graphics and music:

> These three types of notation are nothing more than three codes, and indeed there is no more reason to be dismayed by a page of figures than by a full musical score, just as there is no reason to be totemically amazed by a nicely elaborated graph. Each code has its advantages and disadvantages, and the code of classical musical notation is very refined and precise, a synthesis of the other two.[27]

The creator seems to have minimized the complexity of his scheme but there is no question that any researcher investigating *Evryali* would be immensely gratified to view the entire score in sketch format. Bucquet suggested that the sketches may be located at the Centre de Documentation Musicale - Maurice Fleuret which, together with the Bibliothèque Musicale - Gustav Mahler, is housed under one roof at 11 ^{BIS} Rue Vézelay, 75008 Paris. Unfortunately, a thorough search of the premises, with the help of the chief archivist, did not yield any sketches.[28] Perhaps Xenakis is reluctant to reveal the sketches: in his article, "*Sur* Herma *et autres*," Claude Helffer writes that "in general, Xenakis did not like showing his graphics, thus, although he had promised them to me, I still had not been able to become acquainted with the sketches of *Evryali*. Why? There could have been a little secret on the part of the

---

[27] *Formalized Music*, 212.

[28] It was a disappointment to find that, except for boxloads of newspaper articles, programmes, reviews, photocopies of six manuscripts and a limited number of published works in the stacks (available elsewhere), the library is not a rich source of Xenakian material.

composer."[29]

The 1981 Salabert edition of *Evryali* is slightly over-sized, measuring approximately 13 1/2 inches high by 10 3/4 inches wide; it is twenty-eight pages in length and contains eight to sixteen staves per page. The Salabert edition is the score most readily available today; it is the score used throughout this study. Although presented in traditional notation and format, there are no measure numbers in the score, with the result that it is virtually impossible to identify specific parts of the music; precisely for ease of identification, measure numbers have been inserted into the working score and are used throughout this thesis. For the same reason, after measure 207 where the use of bar lines in the score is suppressed, it has been necessary to reinstate them. No time signature is given but the values of the measures define 4/4 time with the tempo indicated as ♩= Approximately 60 mm . In addition to conventional dynamic markings and pedal indications there are also, from time to time, conventional instructions given in both French and Italian, such as *sans sourd* and *legato*. Except for three instances at measures 65, 189 and 219, where timed silences are indicated, all rests are notated in the traditional manner. Pedal markings are clearly prescribed.

It must be observed, however, that an earlier Salabert edition has been in circulation. This must be the score which Peter Hill used for his Example 2

---

[29] Claude Helffer, "*Sur* Herma *et autres*" in *Regards sur Iannis Xenakis* (Paris: Éditions Stock, 1981), 201.

in his 1975 article, "Xenakis and the Performer."[30] In Takahashi's reply to that article, his exasperated tone, "Hill's Ex. 2 perpetuates a silly misprint in the printed score . . . the third line must be in the treble, instead of the bass, clef,"[31] suggests that a performer must have some intuitive way of discerning whether or not the printed score is correct. In working from a score published before 1981, Hill unknowingly played the wrong notes and, unfortunately, the same error was duplicated in the example which Paul Griffiths excerpted for use in his monograph, *Modern Music*. In fact, close reading of Griffiths's Example 64, which is equivalent to measures 81 and 82 of the Salabert 1981 edition, reveals no fewer than eleven discrepancies; of these, nine are associated with dynamic markings, one with an incorrect clef and one with an incorrect accidental.[32]

Already the case is clear: *Evryali* is full of complexities and some ambiguities.

---

[30] Hill, 18.

[31] Yuji Takahashi, "Letters to the Editor," *Tempo*, 115 (December, 1975), 53, hereafter cited as Takahashi.

[32] Griffiths, 236.

Chapter II

The Twentieth Century offers a vast panoply of musical genres and styles. Post-romanticism, exoticism, impressionism, expressionism, neo-classicism, folklorism, serialism, aleatoric music, minimalism, eclecticism, neo-romanticism: this is just a selection of the kinds of labels which have become attached to the great musical mix which this century has produced. At the particular moment in history when Xenakis made his first vocational forays into the sphere of musical composition, in the post-WW II Paris of the early 1950s, integral serialism was flourishing while, at the same time, experimentation with aleatoric music was in its infancy. Both of these compositional techniques were rejected by Xenakis.

Xenakis's prime objection to serialism lay in his assertion that, in its absolute determinism, it was too constrictive: ". . . the serialists of the Vienna school, not having known how to master logically the indeterminism of atonality, returned to an organization which was extremely causal in the strictest sense, more abstract than that of tonality . . . the completely deterministic complexity of the operations of composition and of the works themselves produced an auditory and ideological nonsense."[33]

Xenakis's objection to chance music was based, firstly, on the premise

---

[33] *Formalized Music*, 5 and 8. This is a *précis* of Xenakis's conclusions of a complex question, which he challenges in the first chapter of his book. It must be pointed out that his assault on serialism is based on philosophical and historical foundations (see *Formalized Music*, 1-10).

that it is impossible for the interpreter, a highly conditioned being, to accept unconditioned choice; and secondly, that in employing chance methods, a composer "resigns his function altogether, that he has nothing to say" and, in so doing, elevates the listener to the rank of composer.[34]

In rejecting the serial and chance methods, Xenakis did not abdicate his responsibility as critic, musician and thinker by simply dismissing these ideas; instead, he grappled with what he perceived to be their inherent problems and pursued an alternative solution grounded in mathematics, science and philosophy. His solution, based on the theory of probability and embodied in the term "stochastic music," is a fundamental compositional component of his *oeuvre* and is, in fact, synonymous with his name.[35]

With *Metastaseis* Xenakis became vitally interested in the portrayal of movement in massive events as displayed in nature: the movements of galaxies, storms at sea, clouds across the sky. It was this desire to depict mass events that prompted him to enlarge the horizon of the principle of causality and to consider theoretical principles that deal with large numbers, namely,

---

[34] *Formalized Music*, 38.

[35] In *Formalized Music* Xenakis explains the mathematical formulations on which many of his compositions are based. In Chapter I, dedicated to stochastic music, Xenakis lays out the historical, logical and theoretical basis for the use of probability theory. My overview presentation of the concept, aided by Matossian's explanation in *Xenakis*, is a synthesis of these two sources. Xenakis claims that he was the first to apply the term "stochastic" to music: "I originated in 1954 a music constructed from the principle of indeterminism; two years later I named it "Stochastic Music," *Formalized Music*, 8. The word "stochastic," as defined by *The Concise Oxford Dictionary*, meaning "governed by the laws of probability," derives from the Greek word, *stokhos*, which means "aim, guess."

the theory of probability. According to Matossian:

> The twentieth century has seen an accelerated change in our perception and description of natural processes, with the abandonment of the Newtonian mechanistic model of the universe characterized by laws of strict causality. Probability theory was introduced in the Twenties to cope with some of the conflicting consequences of Einstein's General Theory of Relativity and quantum mechanics. The characterisation of physical reality in a non-deterministic way is done by giving probabilities of occurrences.[36]

Matossian explains that Xenakis then applied a process of transformation known as *substitution by analogy*, which allows theories applicable to one area of investigation to be applied to another to solve similar problems. Xenakis turned to Maxwell's and Boltzmann's kinetic theory of gases, which states that "In an enclosed space of constant temperature and pressure the speed of molecules tends to a mean distribution."[37] If, however, either the temperature or the pressure changes, so will the distribution of molecules. In adopting and adapting this scientific theory to music, Xenakis was able to plot graphically the two principal co-ordinates of sound, namely, pitch and duration, to obtain a probable distribution, the result of which was the *glissando*, "the perpetual

---

[36] Matossian, 91. Matossian's definitive work is an invaluable aid to understanding Xenakis's theories: it serves to bridge the gap between the mathematical and scientific formulations expressed in *Formalized Music* and a final musical score. As is the case with the biographical data, Matossian's monograph is an essential source of the present study.

[37] Matossian, 92.

counterpart of speed in the theory of gases."[38]

Xenakis had first begun experimenting with stochastic ideas in *Metastaseis,* where *glissandi* are featured, but he extended and developed the application in *Pithoprakta* and in *Erikthon,* where *glissandi* occur while all the other musical elements, such as duration, density, intensity and timbre, remain constant. It is important to note, however, that even though some musical elements are constant, the general effect which emerges is that of sonorous material *in movement.* Matossian declares that Xenakis "used the word 'stochastic' to express the idea of masses tending towards a mean or goal such as a stable state: 'A music constructed from the principle of indeterminism . . . the Theory of Probability with the standard deviation and known by the term statistical deviation'."[39]

The theory of probability with the standard deviation has been successfully used and developed by the scientific world for a variety of applications. One such application, employed by medical technology to establish normal values for all clinical methodologies, may serve to illustrate the abstract concept and to demonstrate its practical explication and value. If the same analytical procedure, for instance, a blood sugar determination, is performed on 1,000 randomly-selected healthy individuals, not every analysis will yield the exact same result. The majority of the results will hover around

---

[38] Matossian, 94.

[39] Matossian, 94.

100 mgs%, while some may be as low as 80 mgs% and as high as 120 mgs%. The reason for the variation is based on variables such as diet, basal metabolic rate and insulin production, variables which cannot be controlled in the experiment. However, a standard deviation of 40 mgs% can be determined, thus establishing a normal range of 80 to 120 mgs%. When persons whose blood sugar levels yield a result of 40 or 60 mgs%, they are said to be hypoglycemic and are in need of sugar; those whose results are 150 mgs% or higher are clearly hyperglycemic and are in need of insulin. However, in spite of the scientific probability involved in practical applications of this kind, there are always exceptions to the rule. In the case of a blood sugar determination, for example, there will always be individuals whose blood sugar results lie outside of the normal range and yet, inexplicably, they are able to function as healthy individuals. The same kind of inexplicable exceptions may also be anticipated in Xenakis's applications.

Xenakis has not consistently applied the stochastic principle or limited its application to the one parameter of pitch: as experimentation and exploration with scientific and mathematical applications were expanded, so stochastics were applied to various other musical dimensions, such as durations and dynamics.[40] To complicate the issue further, it must be emphasized that Xenakis manipulated results from the mathematical formulations in order to render them more "musical." In her discourse about

---

[40] Matossian, 153.

Pithoprakta, Matossian describes the Xenakian technique as follows:

> The resulting figures he reconverted into musical notation and made necessary adjustments; when, for instance, a value appeared so high as to be beyond the range of hearing or too exact in frequency as to need correction to the nearest semi-tone. At every stage the pre-selection of materials is called into question or justified by the results. Although some critics have genuinely misunderstood his intentions, Xenakis never claimed that a rigorous mathematical or analytic basis is sufficient to produce a well-formed piece of music.[41]

Since stochastic characteristics are integral to the Xenakian idiom, there is every reason to expect them, in one form or another, in *Evryali*.

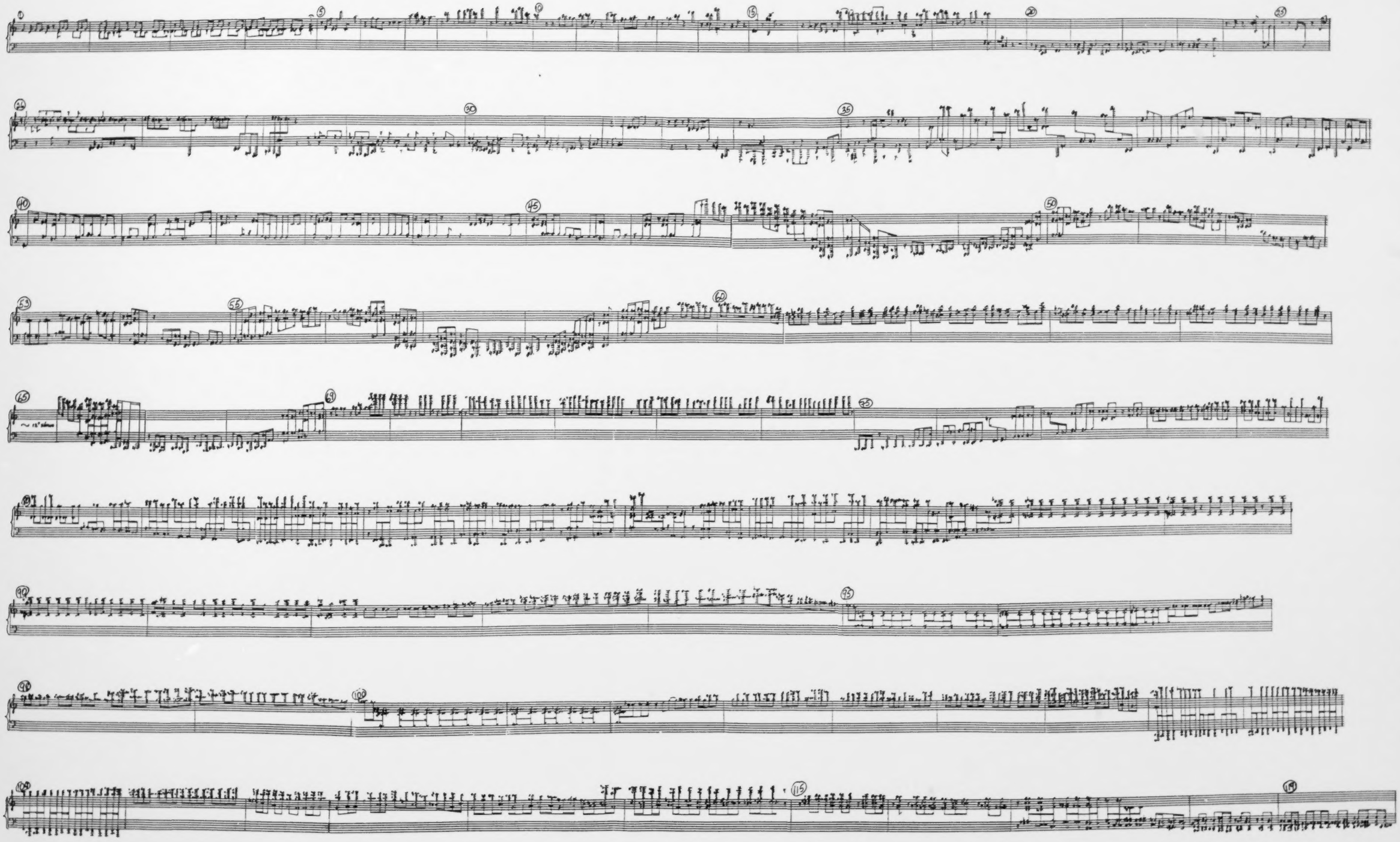
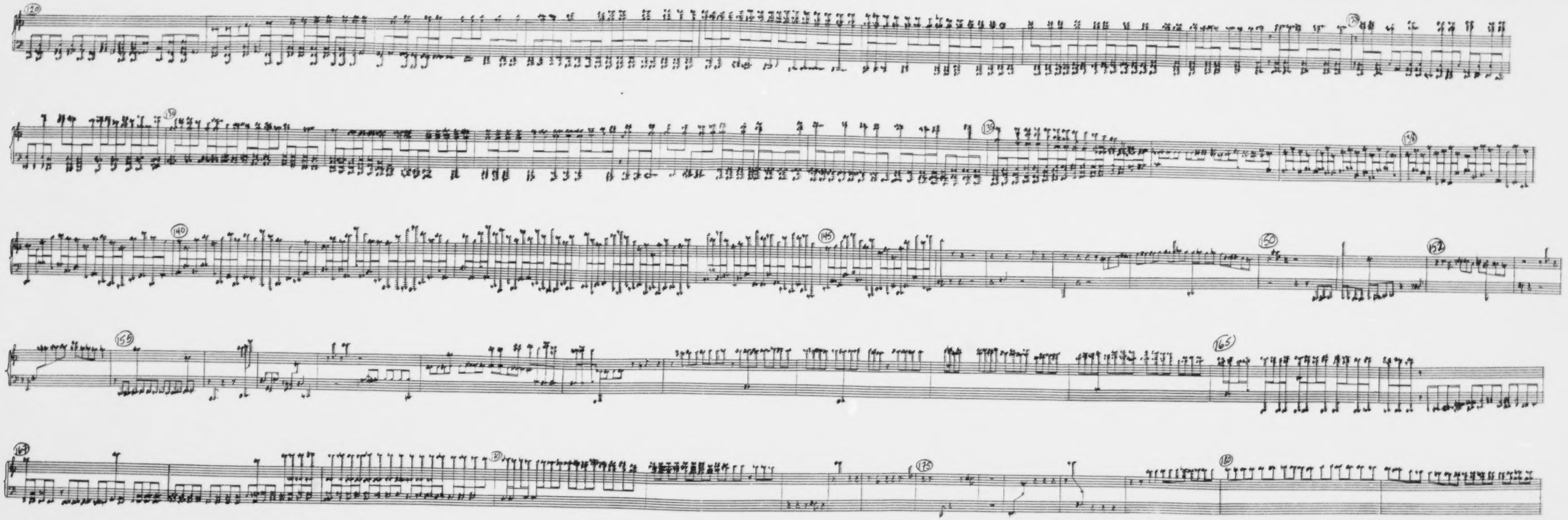
---

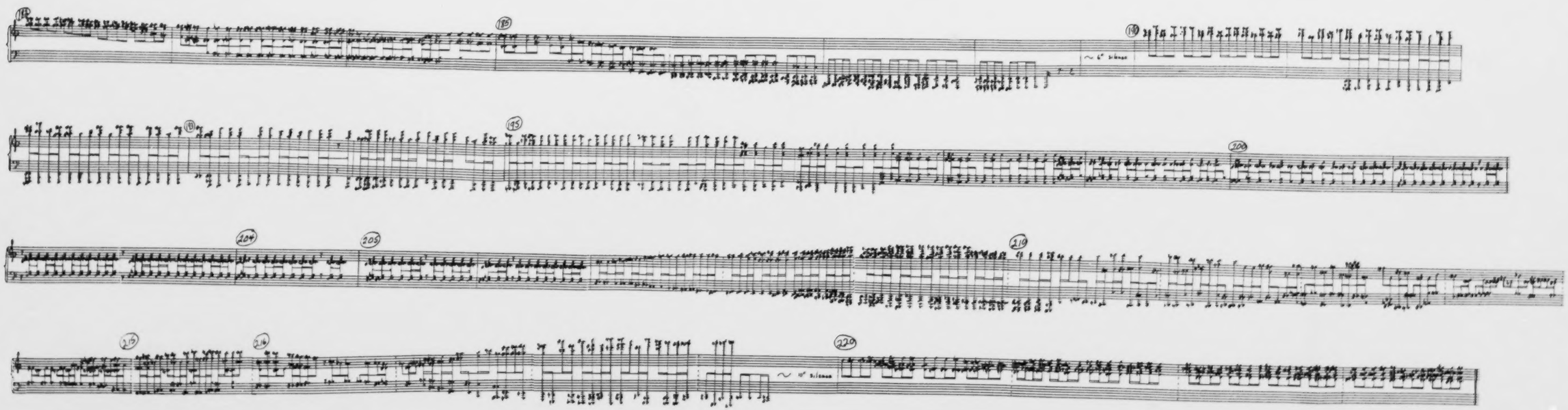
[41] Matossian, 106.

Chapter III

The score of *Evryali* presents a daunting spectacle, not only to the pianist, but also to the analyst. Working from the score while listening to the piece, the eye and the mind must engage in musical and intellectual acrobatics, as one focuses on several staves concurrently, often enough involving pitches one or two octaves above or below the notated pitches. Xenakis's particular mode of notation together with the actual sounds produced generate extreme difficulty for the interpreter. To render the score more accessible for analysis, the entire score has been reduced on to the grand staff with the octave transpositions removed, as shown on pages 26 and 27. Although such a pragmatic approach destroys the individuality of the voices and gives an impression of a primarily chordal piece (which it is not), this kind of overview is invaluable: the music is visually simplified, the compact layout allows for an enlarged sense of perspective of the musical journey and, for analytical purposes, the format facilitates easy reference.

In order to arrive at this presentation, the score was first of all rewritten by hand and compressed on to the grand staff; it was then reduced, via photocopying, and cut and pasted several times. Upon first inspection, the reader may wonder if the size of the notes belies some compulsion to demonstrate just how tiny notes can be written! However, as the intent of the reduction is to shift the eye and the understanding of the music from the very rigorous detail of the original score to a perspective of overview of the general

Grand Staff Reduction of *Evryali*


120
130
135
138
140
145
150
152
155
165
170
175
180


185
190
195
200
204
209
210
215
216
220

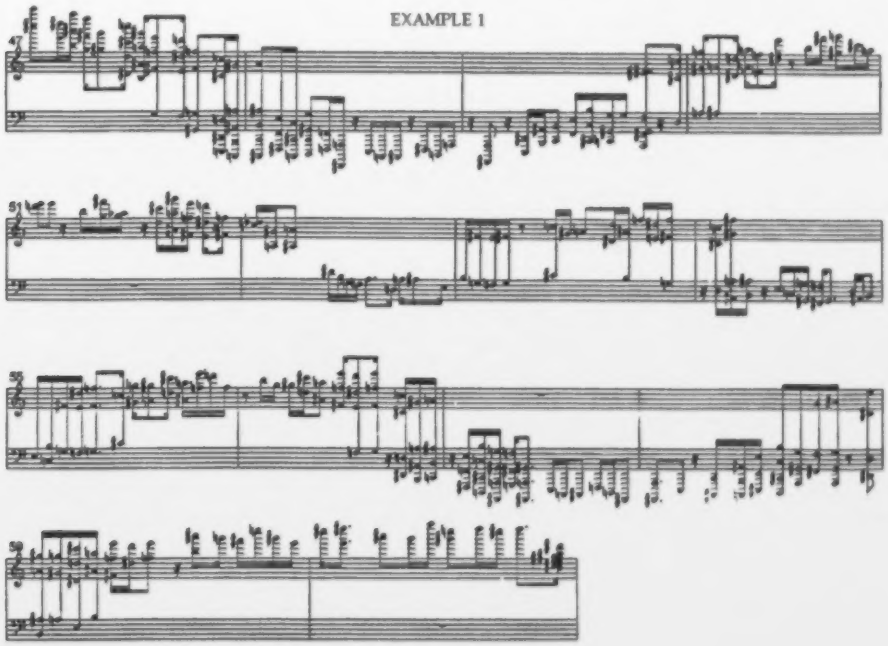
registral contour of the piece, it is not necessary to be able to read the notes clearly as must be the case for performance. In short, it is a kind of study-score reduction in which the twenty-eight pages of the 1981 Salabert edition are set out in two.

While every care has been taken to renotate the score accurately, it must be re-iterated that the prime function of this undertaking is to shift the focus from detail to a sense of overview of the general registral dimension of the music. When a pitch on the Salabert score is indicated as one or two octaves above or below a pitch on a staff, on the reduction it has been notated with ledger lines to demonstrate, visually, its exact registral placement. The transference to the grand staff, however, imposes difficulties which require compromise. The reduction is consistent with the score except for the following two instances: when two pitches a semitone apart using the same letter name occur simultaneously, such as D-sharp and D-natural in measures 199 to 205, the D-natural is notated in a horizontal position to the D-sharp; in measures 26 and 29 where the rhythm of inner voices is too complex to notate accurately, the correct pitches are notated, but only the outer voices reflect the correct rhythm in the measures.

The reduced score of *Evryali* substantiates the importance of register; in fact, as the pitches rise and fall in the registral sweep, it highlights register as one of the prominent features of the piece. The registral journey encompasses the entire scope of the piano, from the highest C-natural to the

lowest A-natural.[42] Within this extreme range, the work exhibits a high degree of organization, attested to by the identifiable shapes which the reduction exposes. Visually, the three most obvious shapes are: 1) waves; 2) configurations where pitches in opposite registers run in oblique, contrary or parallel motion to each other; and 3) blocks of chords. On the first page, for instance, there is no question that a gigantic wave is outlined as the pitches sway upwards and downwards in measures 47 to 60 (Example 1).

EXAMPLE 1



[42] One of the anomalies found in *Evryali* concerns the range of musical notes on the piano: in measures 218 and 219 of the original manuscript, there are five pitches notated as C-sharp, five octaves above middle C; in other words, a semitone beyond the scope of the normal eighty-eight key piano (see measures 218 and 219 of X-Y axis sketch, page 50. Roger Woodward told me (conversation, April 1, 1996) that he plays those five notes transposed one octave lower. This interesting phenomenon has not been incorporated into the 1981 Salabert score where those particular notes are depicted as B-naturals, four octaves above middle C. This discrepancy in musical notation could perhaps be resolved by viewing Xenakis's original graphic sketches.

Contrapuntal shapes emerge at measures 81 to 87 and, again, more dramatically, at measures 107 to 109; and blocks of chords appear at measures 61 to 64, 69 to 74 and 88 to 93.

A comparison of the piano reduction with Xenakis's own sketch of *Evryali*, reproduced on page 15, strongly suggests correlation with, approximately, measures 36 to 70, the section of music which encompasses the outline of the huge waves. Although this single page of Xenakis's sketch offers evidence that mathematical formulations have been used to construct these measures, for example, the formula m(t) = 11 , it is difficult to know if mathematical calculations or scientific applications are responsible for the other musical elements, such as the frequency of pitches, the registral distribution of the pitches, the dynamics and the rhythmic movement, which appear elsewhere in the piece. The wave, then, seems to be mathematically generated, but the question persists: what compositional processes may account for the contrapuntal shapes, for the blocks of chords?[43]

Matossian does not state directly that in this composition, *Evryali*, Xenakis incorporated the principle of Brownian movement (or its synonym, "random walk"), defined as "a continuous random movement of particles suspended in a gas or liquid buffetted by the molecules in thermal

---

[43] In order to obtain further information concerning *Evryali*, I wrote to Xenakis on January 11, 1996, making enquiries about the mathematics. Unfortunately, at the time of preparation of this manuscript, as yet there has been no response.

agitation."[44] However, from the chronological ordering of her text the presence of Brownian movement in *Evryali* is implied:

> By 1973 [Xenakis] was still drawing material[s] out of Brownian movement, but designing them into distinctive figures called arborescences or dendritic forms which start from a common source and ramify outwards like the branches of a tree . . . translating such patterns into a pitch/time space he obtained a form of polyphony whose parts are co-related but not mechanically locked together as in counterpoint; a polyphony with the random element preserved and with individual voices remaining continuous.[45]

It is unfortunate that in *Formalized Music* Xenakis did not confirm and explicate the mathematical formulations of Brownian movement as he used them in *Evryali*; perhaps because *Formalized Music* is devoted primarily to orchestral works, *Evryali* is not even mentioned in that publication.[46] However, in the discussion of dynamic stochastic synthesis in Chapter XIII, Xenakis deliberates on the creation of a "plane wave in an amplitude-time space (atmospheric pressure-time), encompassing all possible forms from a square wave to white noise."[47] He explains that:

---

[44] Matossian, 230.

[45] Matossian, 233.

[46] As noted in the Introduction, the first edition of *Formalized Music* was published in 1971, obviously prior to the creation of *Evryali*. However, the 1992 edition contains additional Chapters X to XIV and Appendix III; *Evryali* is not included in the discussion about Brownian movement.

[47] *Formalized Music*, 289.

> An attempt at musical synthesis according to this orientation is to begin from a probabalistic wave form (random walk or Brownian movement) constructed from varied distributions in the two dimensions, amplitude and time (a, t), all while injecting periodicities in t and symmetries in a. If the symmetries and periodicities are weak and infrequent, we will obtain something close to white noise [containing many frequencies with about equal energies]. On the other hand, the more numerous and complex (rich) the symmetries and periodicities are, the closer the resulting music will resemble a simple held note.[48]

At the end of his explanation of how to construct such a wave, Xenakis confirms that this is the technique he used in *La Légende d'Eer* (1977), a seven-channel electronic tape composed in 1977 for the sound and light environment of one of his architectural designs called the Diatope. But he makes no reference to the use of this technique in *Evryali*.[49]

From these excerpts two things become apparent: Xenakis's words verify that Brownian movement is definitely a probabilistic wave form, in other words, a form which is stochastically generated; and secondly, there is the suggestion that a particular brand of Brownian movement, the kind described by Matossian as "dendritic forms or arborescences," may be found in *Evryali*. As one examines measures 75 to 87, the words of both Matossian and Xenakis are confirmed visually and aurally. Measure 75 marks the beginning of the first arborescence: it originates from one pitch, A-natural in the lowest

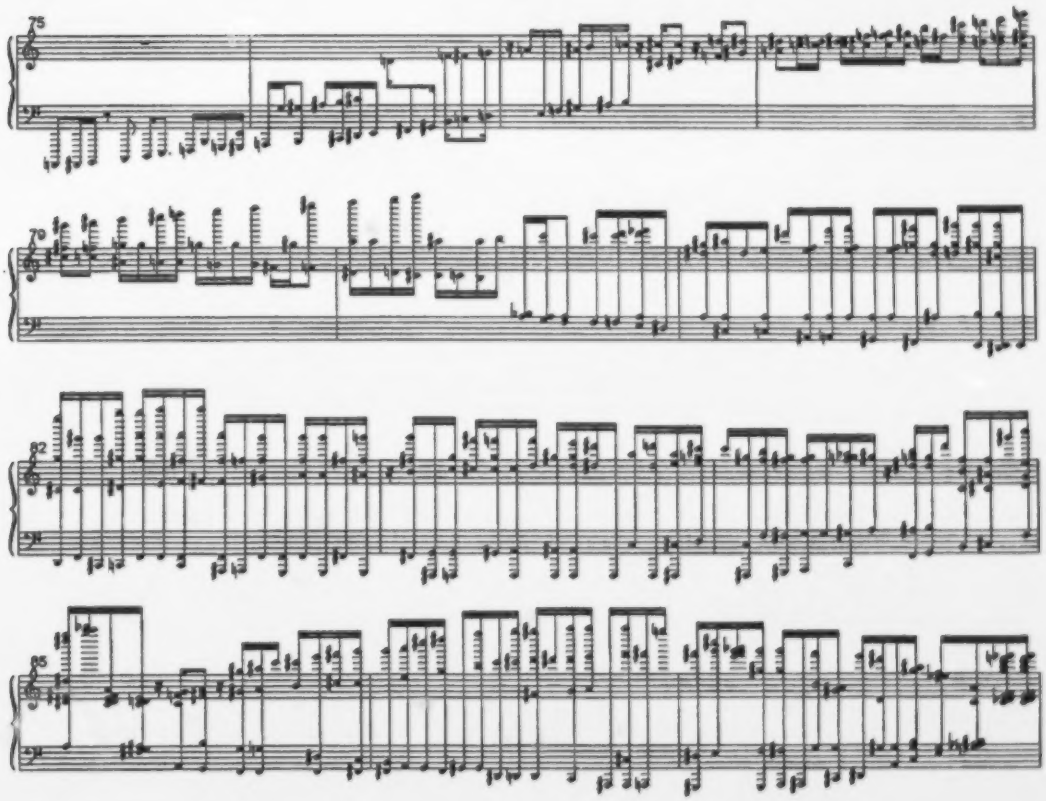
---

[48] *Formalized Music*, 289.

[49] *Formalized Music*, 293.

register of the piano, and expands in amplitude as the music proceeds to the penultimate sixteenth-note of measure 87. The process may be likened to a compact view of "organic growth"[50] in nature (Example 2).

EXAMPLE 2



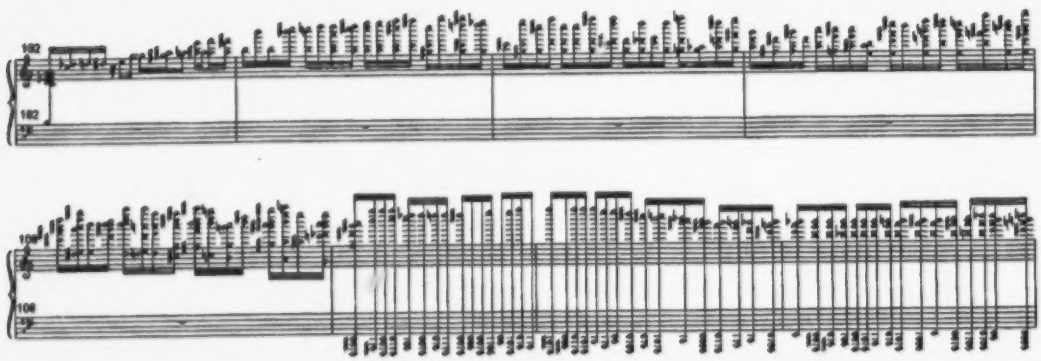
The second example, from measures 102 to 109, also seems to correlate with Matossian's example of an arborescence. The music begins on the single note, E-natural, after the sixteenth-rest on the second beat of measure 102, and

---

[50] Matossian, 235.

grows outwards until true dendritic forms appear in full bloom, like "square waves," at measures 107 to 109, their mirrored images reaching downwards, like roots of great trees (Example 3).

EXAMPLE 3



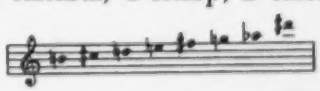
In spite of its shape on the grand staff reduction and its seeming physical correspondence with Matossian's description of an arborescence, Marie-Françoise Bucquet emphasizes that this passage possesses a static quality quite different from the huge, moving lines found in measures 75 to 87.[51] In this instance, the rhythmic drive persists but the pitches are not registrally mobile, thereby creating a kind of static block in the upper register at measures 103 to 106 and a static block in the lower register at measures 107 to 109.

The concept of blocks of chords and naming them as such is not entirely straightforward. When hearing those passages which are identified in this study by the term, "block of chords," they do *sound* like blocks; the choice of

---

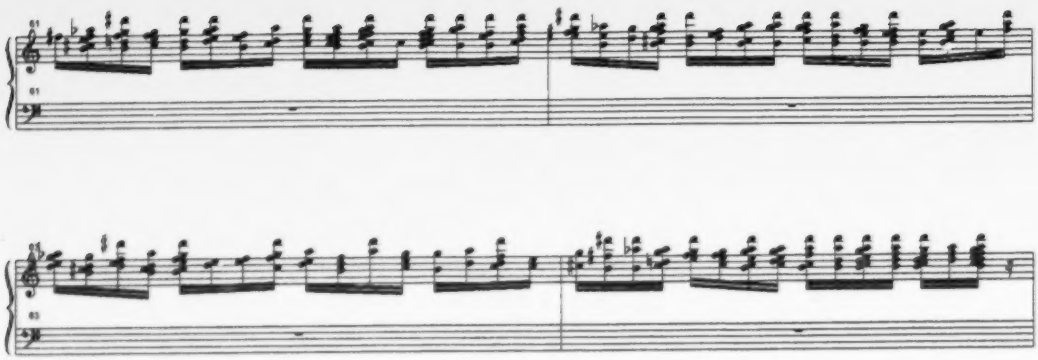
[51] Interview, December 15, 1995.

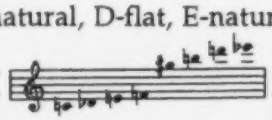
the phrase "blocks of chords" is simply a label, adopted for the sake of convenience, to describe those sections which have a particular musical characteristic, that of stopping or "blocking" waves or arborescences from forming or continuing. It must be pointed out, however, that Bucquet wonders if Xenakis would approve of the phrase; she prefers the terms "*ostinato*" or "*ostinati*" to describe these passages, which she sees as "static elements which are repeated, fixed events," especially because, for her, the word "blocks" has associations with wood blocks, used as a percussive instrument in *Synaphai* and other compositions by Xenakis. She points out that these passages have permutations; furthermore, she insists, "He [Xenakis] never told me about blocks."[52] For the sake, then, of absolute clarity, in this study the use of the phrase "blocks of chords" has two functions: it describes the sonic effect of "repeated, fixed events" and, secondly, it describes the strategic function of blocking emerging waves or arborescences.

Investigation of the blocks or *ostinati* reveals that there are distinct differences in the way the chords are constructed and rhythmically repeated. In the first set at measures 61 to 64 eight pitches, B-natural, C-sharp, D-natural, E-natural, F-sharp, G-natural, A-flat and D-sharp (), are used over and over again in various combinations and densities to the same rhythm, and it is only on the very last sixteenth-note of measure 64 that all eight pitches appear simultaneously (Example 4).

---

[52] Interview, December 15, 1995.

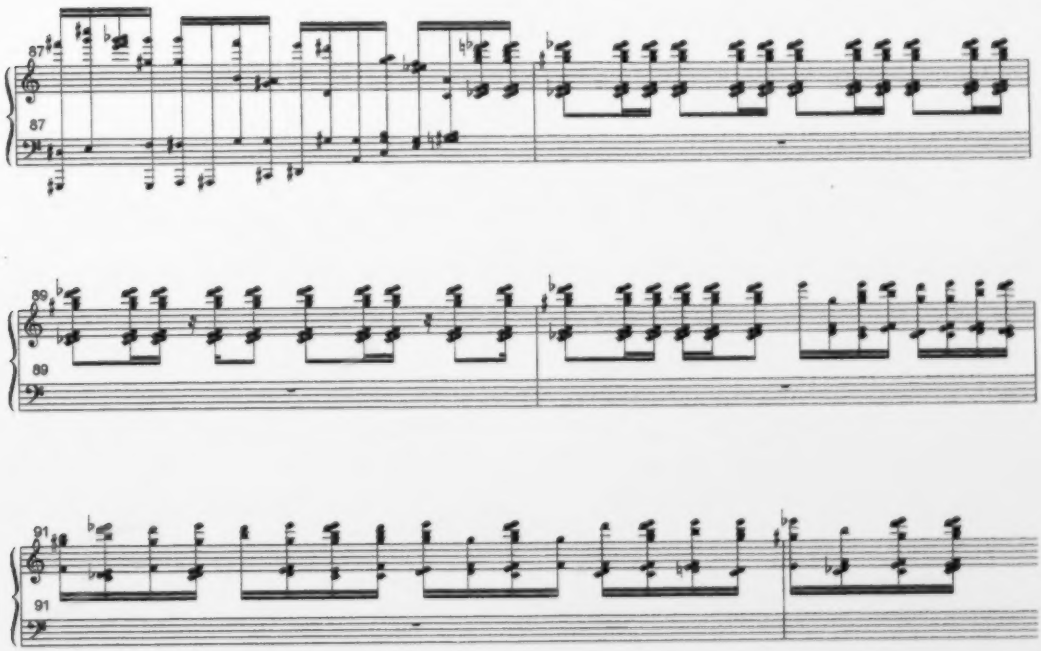
EXAMPLE 4

The variations in the recurrence among the same eight pitches suggest combinations which are stochastically generated, a suggestion which Bucquet confirms. She points out that each combination among the eight pitches presented occurs only once; in her words, "the pitches are combined to the exhaustion of the material."[53] It is also important to note that the pitches in the blocks of chords or *ostinati* do not traverse a registral expanse: they remain fixed or riveted to particular sections of the keyboard.

The treatment of the block chords at measures 87 to 92 is different in that the pitches are not immediately dislocated. On the last two sixteenth-notes of measure 87, measures 88 and 89 and the first eighth-note of measure 90, the same eight pitches, C-natural, D-flat, E-natural, F-natural, G-sharp, B-natural, D-natural and E-flat, (), are repeated in the same physical position but to a changing rhythm. On the first sixteenth-note of the first beat of measure 90 the E-natural and F-natural are eliminated to leave a

---

[53] Interview December 15, 1995.

structure, presented five times, with only six pitches. From the third beat of measure 90 the chords split, break down or subdivide into a kind of alternation process, appearing in various combinations and densities, that is to say, in *stochastic permutation*, as in measures 61 to 64. It is only on the last sixteenth-note of the first beat of measure 92 that the eight pitches appear simultaneously (Example 5).

EXAMPLE 5

With rare exception, the blocks of chords are accompanied by intense dynamics and occur in either the middle (measures 95 to 96, 100 to 102, 197 to 206), mid-to-high (measures 61 to 65, 87 to 92) or high (measures 68 to 75) registers. In all instances, however, the dramatic effect is the same: in spite of the ongoing motion, they slow up the forward thrust of the music while, at the

same time, intensifying the dramatic impetus. This gives rise to paradoxical moments of continuous motion combined with a sense of arrest. Perhaps it is Matossian who best articulates the unfolding of events:

> Changeful, quicksilver lines move freely but are trapped periodically, then pushed with motoric energy. They try to escape through flights of pitch . . . but are constantly hemmed in. Energy is charged up by the intense beat but never finally released . . . organic growth through the introduction of arborescences is never allowed free reign [sic]. Xenakis threw in obstacles, boulders of solid metre and compact intervals to check the main current and to cause new eddies and rates of flow . . . .[54]

Throughout *Evryali* there is a duality which constantly pervades the piece: as a wave begins, it is either cut off by blocks of chords or caught up in the early stages of arborescent formations, which eventually become "square waves." It is as though something is struggling desperately to get out, to be expressed in an energetic form, but is frustrated at every turn by some kind of opposition, confrontation or struggle with a different and more forceful source of energy.

The pace of *Evryali* is rapid. Although there are syncopations, ruptures and full stops, the general impression is that of a consistent activity or energy level, in a style reminiscent of a motoric whirlwind, the most prominent rhythmic figure being . The question of whether or not the rhythmic patterns are stochastically derived has also been considered. The nature of the rhythmic variations could be interpreted as probabalistic, except

---

[54] Matossian, 234-35.

for Takahashi's assertion that it is "more deterministic": "The 'rhythm' in *Herma* and *Eonta* is stochastic: that is, the notation is only an approximation. In *Evryali* it is more deterministic, the evenness of attacks being the decisive factor to achieve the continuity."[55] Unfortunately, Takahashi does not explain the exact meaning of the term, "deterministic," in this context, thus the direct relevance and meaning of his remark remains unclear.

The dynamics, essential to the spirit and vitality of *Evryali*, may be categorized in four ways: those which change abruptly in rapid succession, as in measures 5 to 40; those where the dynamics in one voice are juxtaposed to different dynamics in another voice, as in measures 154 to 164; those longer passages where there is a constant increase in dynamics as, for example, in measures 179 to 186; and those extremely dramatic passages, where block chords invade the piece and then suddenly give way to complete silence or *pp*.

The dynamics are a critical musical element. As there exists opposition between blocks and arborescences, so there is opposition in the dynamics. And the dynamics, coupled with pedal markings, are invaluable indicators of sectional divisions, whether the divisions are large or small. Marie-Françoise Bucquet contends that pedal markings create individual categories, individual classes of sound; they separate elements, create contrast and clarify different

---

[55] Takahashi, 53. From Matossian's description of the relationship between Xenakis and Takahashi in which "their discussions flowed in a lively correspondence with Takahashi voraciously demanding information on new developments and theories upon which Xenakis was working at the time" (Matossian, 147-48), Takahashi's interpretation is not easily dismissed.

environs.[56] It is important to note that there are no consistent, specific correlations between dynamic levels and the various shapes (waves, blocks of chords, arborescences).

Claude Helffer's performance experience attests to the importance of the opposition of the dynamics: "Here, when I was playing, he [Xenakis] stopped me because I was playing *forte* instead of *mezzo-forte*, and what is important for him is the opposition of the sections with pedal, without pedal, *forte*, *mezzo-forte*, and *piano* of the dynamics. For Xenakis hears the difference of the sounds of dynamics more than in the notes."[57]

At this point in a conventional musical analysis the reader may expect a discussion on pitch hierarchy and the relationships among pitches as they formulate a harmonic language in the work under investigation. However, the parameter of pitch *per se* does not require further investigation because, for this discussion at least, it has no direct relevance to the interpretation and performance of *Evryali*. In tonal music the release of the dominant seventh, for example, may have a very direct link to performance, but in *Evryali* there is no similar link. The interviews with the three musicians substantiate this view: none of the discussions centred on pitch, but rather on registral, textural, gestural and regional categories and on the performance of these. The element of pitch, therefore, could not be construed as equally significant in *Evryali*, and

---

[56] Interview, December 16, 1995.

[57] Interview with Claude Helffer in Paris, December 18, 1995.

for this reason, the topic has not been pursued in any depth.[58] On the other hand, pitch in relationship to time, shapes and overall form has been explored in detail later in this chapter, and has been very revealing of *Evryali*'s uniqueness.

It has already been postulated that the use of register is one of the most prominent musical features in *Evryali*, but the registral organization in this piece may not be considered as a separate entity. Register is the very essence of formations of waves, arborescences, block chords and silences; in other words, it creates the shapes. But register is always intimately connected with other musical dimensions such as rhythm, texture and dynamics in a variety of combinations providing the background against which register is displayed.

When listening to the piece, the mind and the ear may also concentrate on the sonorities articulated by the combinations of musical elements. In considering the sonorous qualities inherent in *Evryali*, it is essential to recognize Xenakis's use of the piano as a percussive instrument, where the "fast frequent attacks produce a resonance in the wood of the piano which Xenakis likes to exploit as a sounding box."[59] It may be argued that it is the sonorities in the various registers which provide the levels of tension throughout the piece; in other words, phrase and momentum are all related to

---

[58] For information concerning Xenakis's fascinating view of the formation of scales (based on the writings of Pythagoras and Aristoxenes) and pitch systems, the reader is directed to Chapters VI, VII and VIII of *Formalized Music* and to Matossian, 170-73.

[59] Matossian, 234.

registral traverse and sonority, both of which are tempered by texture and dynamics.

What musical content, then, may be distinguished as articulating large-scale form in *Evryali*? When asked to describe the form of *Evryali*, Marie-Françoise Bucquet was caught slightly off-guard. After a lengthy pause her response caught her interviewer by surprise: "I never looked at it."[60] Of course, *Evryali* is not a "classical" piece and, from her deliberations with Xenakis, she has understood that he does not wish his music to be misappropriated for a conventional model. With the use of a persuasive analogy she resists reducing *Evryali* to a Nineteenth-Century model: "It's like looking at a piece of abstract art and seeing a car."[61] Although she does not apply formal tools, Bucquet frequently refers to the "itinerary" and speaks of the elements which govern the piece--the stochastic organization, the arborescences, the impetus of each phrase--in short, of the musical elements in the score which may be isolated, identified, associated and enumerated. Itinerary, in this context, is distinct from form; it distinguishes *momentum* and *objective* as a substitute for form; in other words, the dynamic thrust and the goal of the music take precedence over form.

Thus far it seems that *Evryali* consists primarily of the alternation of the four basic textural and registral types identified as waves, arborescences,

---

[60] Interview, December 20, 1995.

[61] Interview, December 20, 1995.

blocks of chords and silences. Within these types, however, much of the musical material is similar. There is, for example, a relentless rhythmic drive running through the whole piece: in spite of the three major silences and the rests which occur during the musical journey, there is no sense of rest or repose such as would be associated with the traditional effect of cadence, nor is there a functional substitute. Another unifying element is the fairly consistent rhythmic pattern inherent in the waves, arborescences and block chords. Furthermore, wave-like material is used in both the waves and arborescences: one may enquire, for instance, if an arborescence really consists of two or more waves occurring simultaneously? Or alternatively, do measures 107 to 109 represent the *co-existence* of block chords and wave, or block chords and arborescence, in which the block chords are in the lower register and the wave or arborescence is in the higher register? How may features, based on similar material, be distinguished from one another?

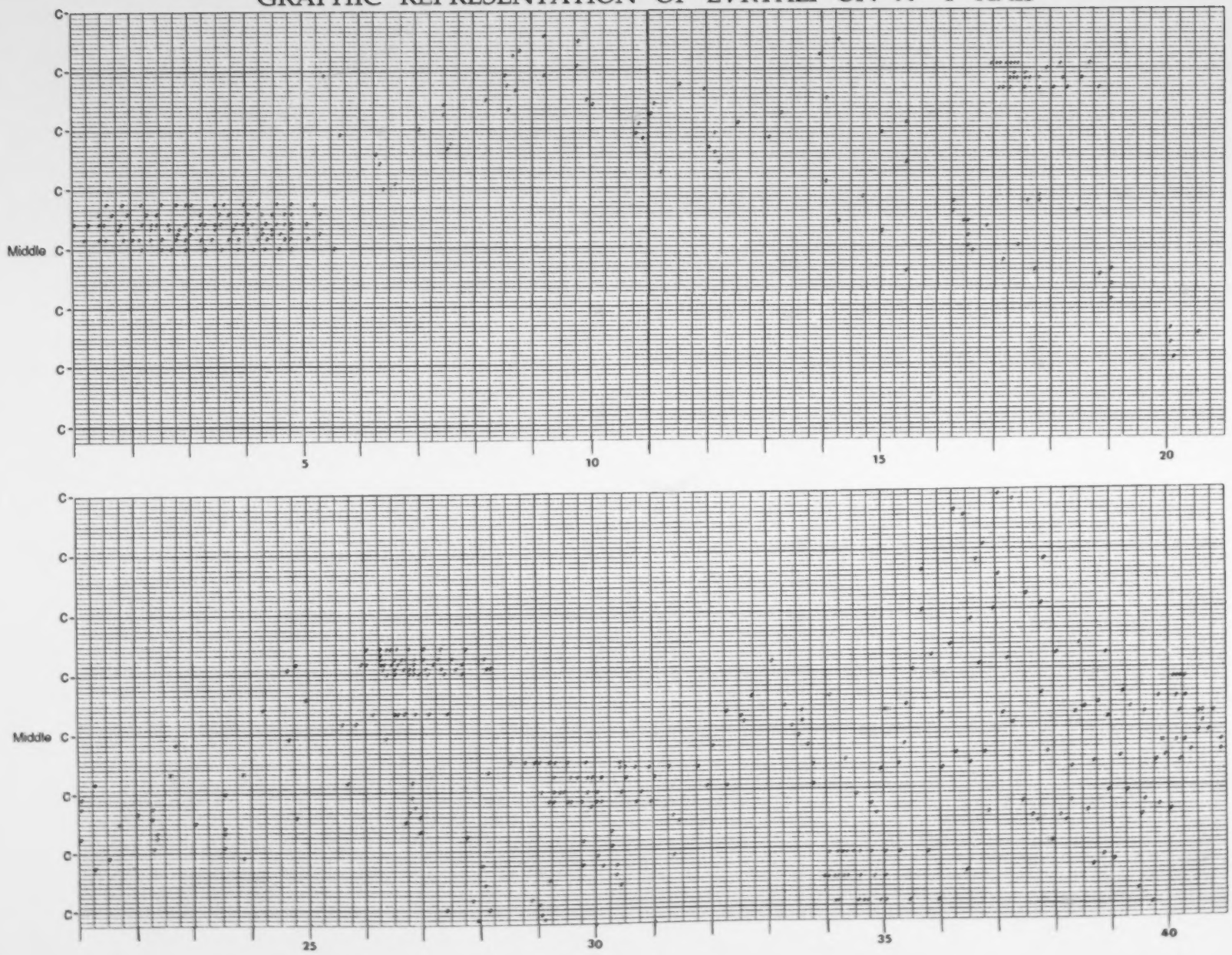
As the most obvious forms of articulation, the three major silences are in a special category; similarly, the blocks of chords assume a particular distinction because they do not move registrally. May one conclude, then, that at a *structural level*, the listening experience of *Evryali* is essentially registral traverse interrupted by block chords or silences? in other words, that regions of registral motion may be differentiated from regions of registral non-motion or *stasis*? Whether or not this is so, within the category of registral movement, it is important to distinguish between waves and arborescences but, since variations exist among waves and arborescences and both utilize wave-like

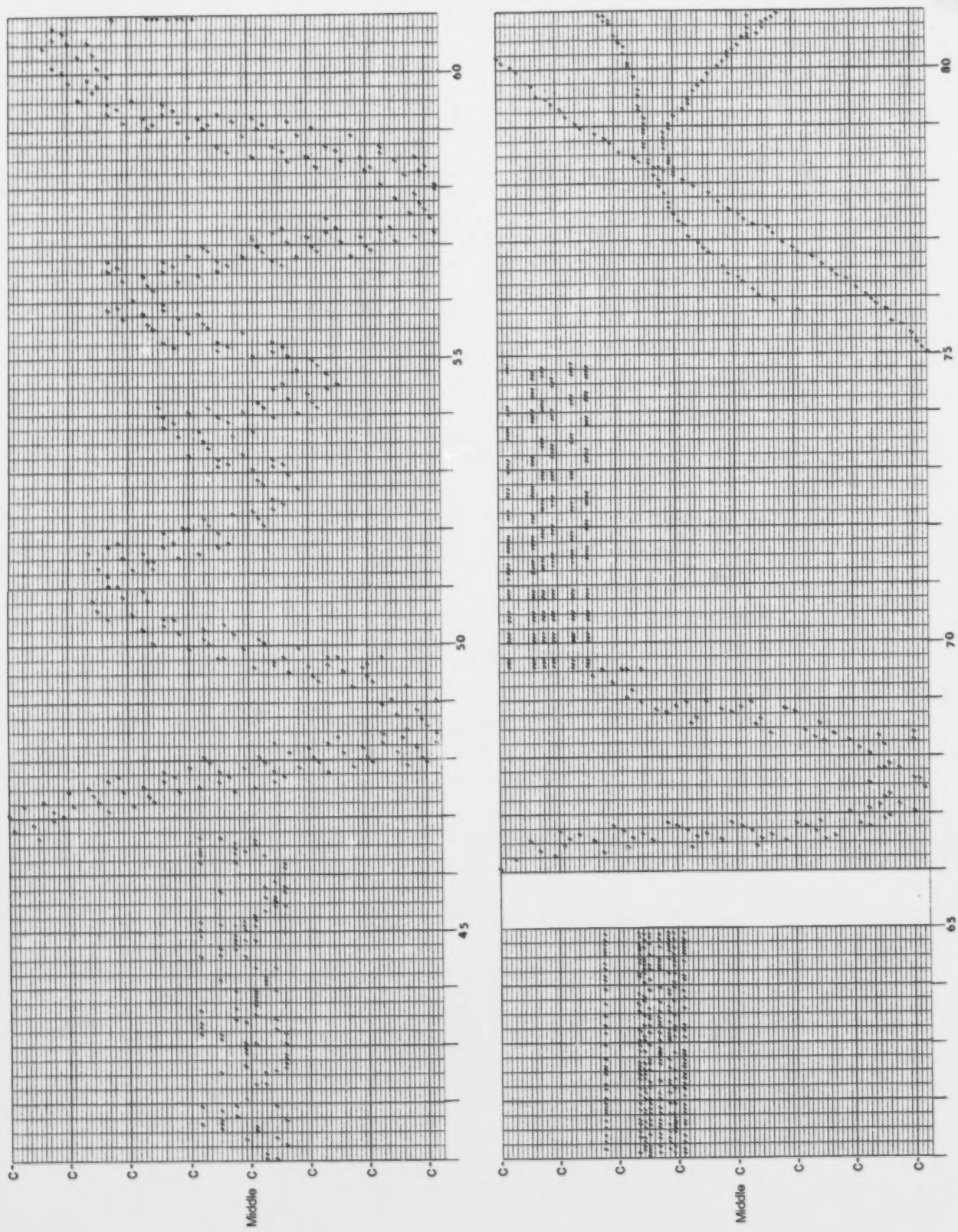
material, is it possible to differentiate between them or to derive a method to reveal the different texture types? How do the texture types unfold in the linear dimension? How does register work through the different texture types? The grand staff reduction alerts the interpreter to the importance of "shapes" within *Evryali*, and thereby provides a good starting point for analysis. But it is not a sufficiently powerful tool for differentiating and delineating the musical material. How, then, may the music be represented in order to give the interpreter a more accurate sonic image of the musical itinerary?

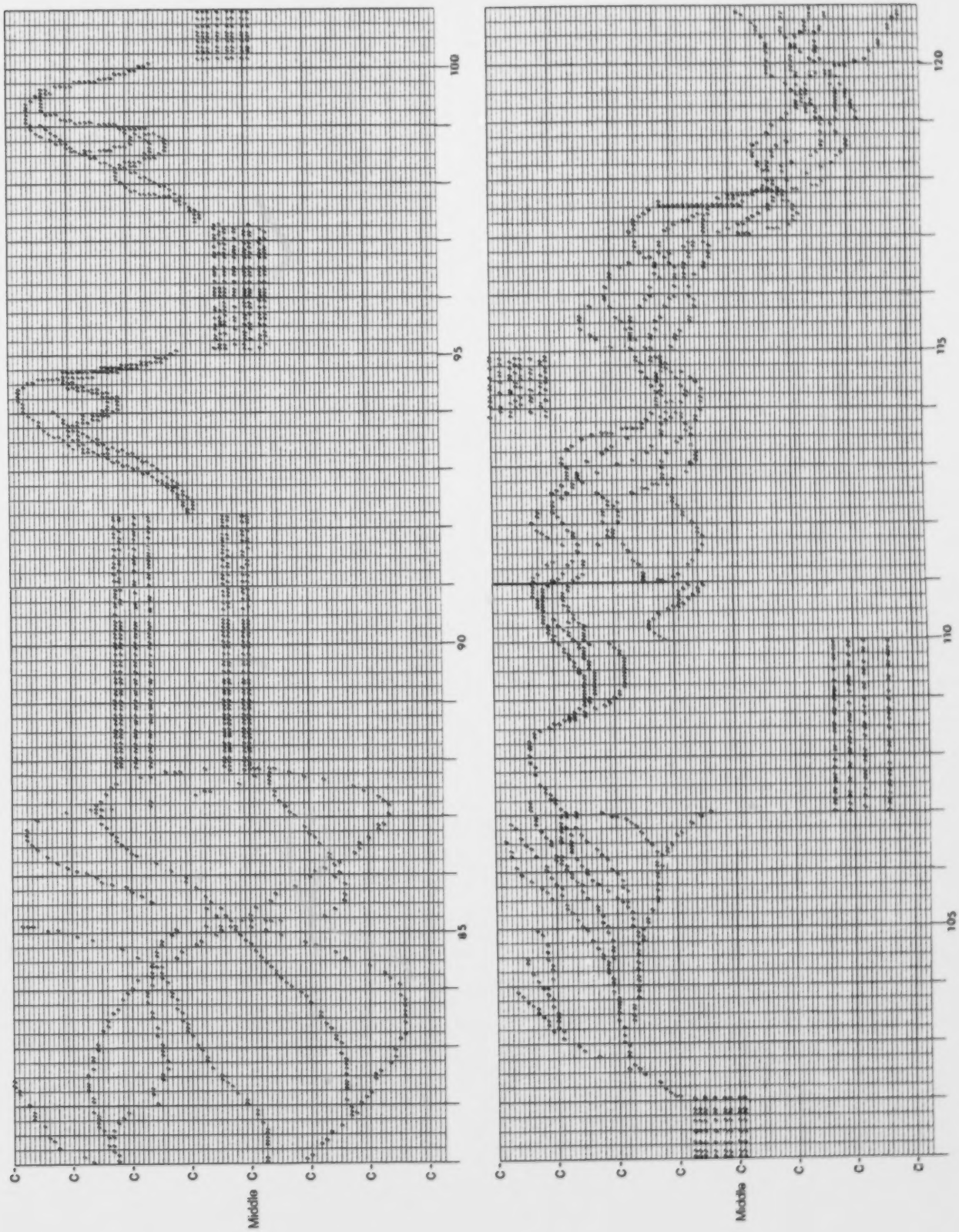
One conventional method employed by analysts is to represent the pitches on an X-Y axis; in this technique a detailed, rigorous presentation of the relative relationship between pitch and time is presented in graphic format. To arrive at the graphic representation which appears on pages 45 to 50, each pitch, represented by a dot, is plotted on an X-axis (where each line represents a semi-tone) against a Y-axis (where each measure is allotted four horizontal spaces); middle C represents the central X-axis and all octaves above and below middle C are labelled. The graph indicates the attacks and the placement of pitches within each measure; dynamics, pedal markings and the duration of the pitches are not indicated.

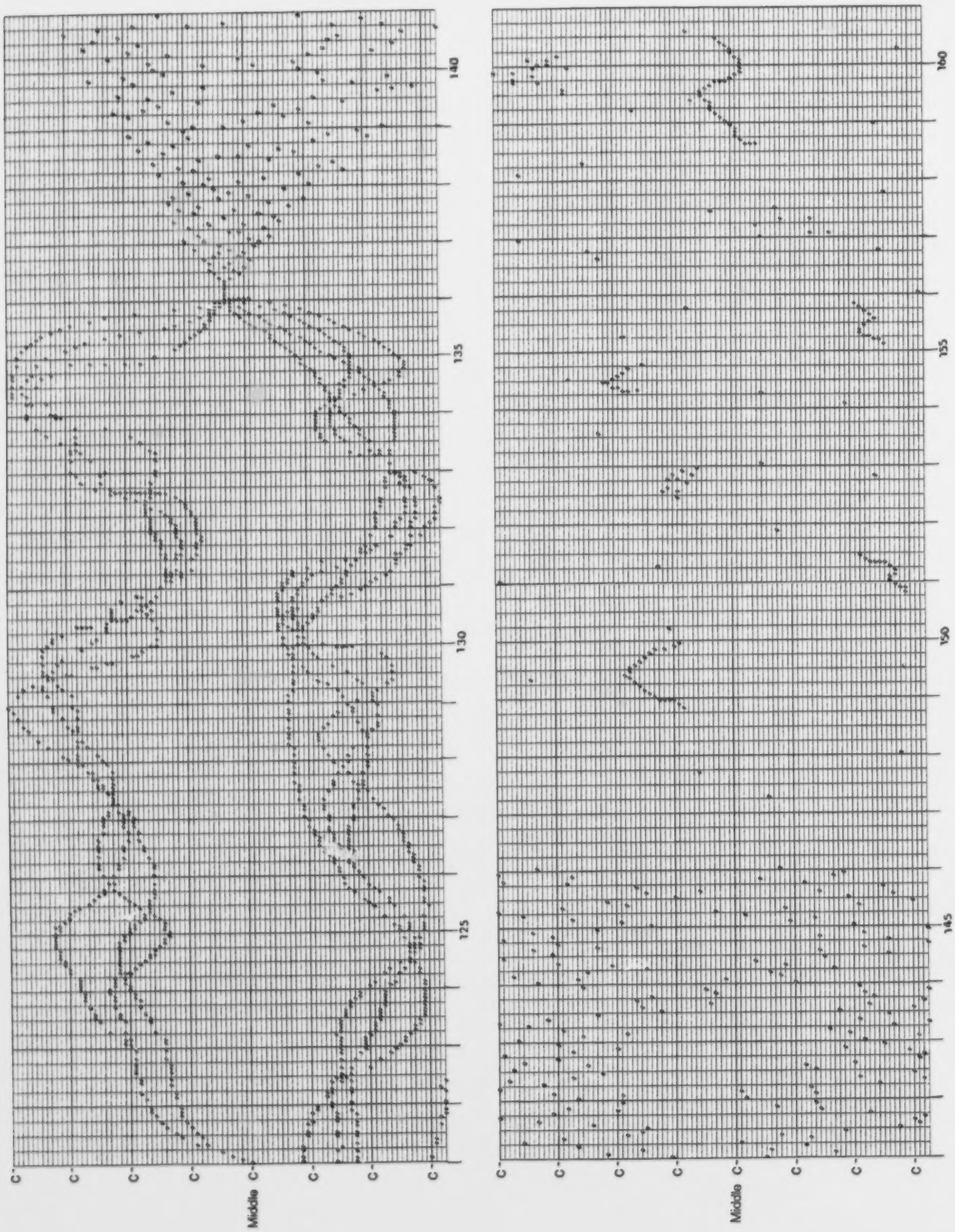
The results of this stage of the work reveal a series of musical events in the form of fascinating shapes relatively proportional to one another in register and density, in essence probably very similar to Xenakis's original graphic sketches (cf. one such sketch reproduced on page 15). It is important to note,

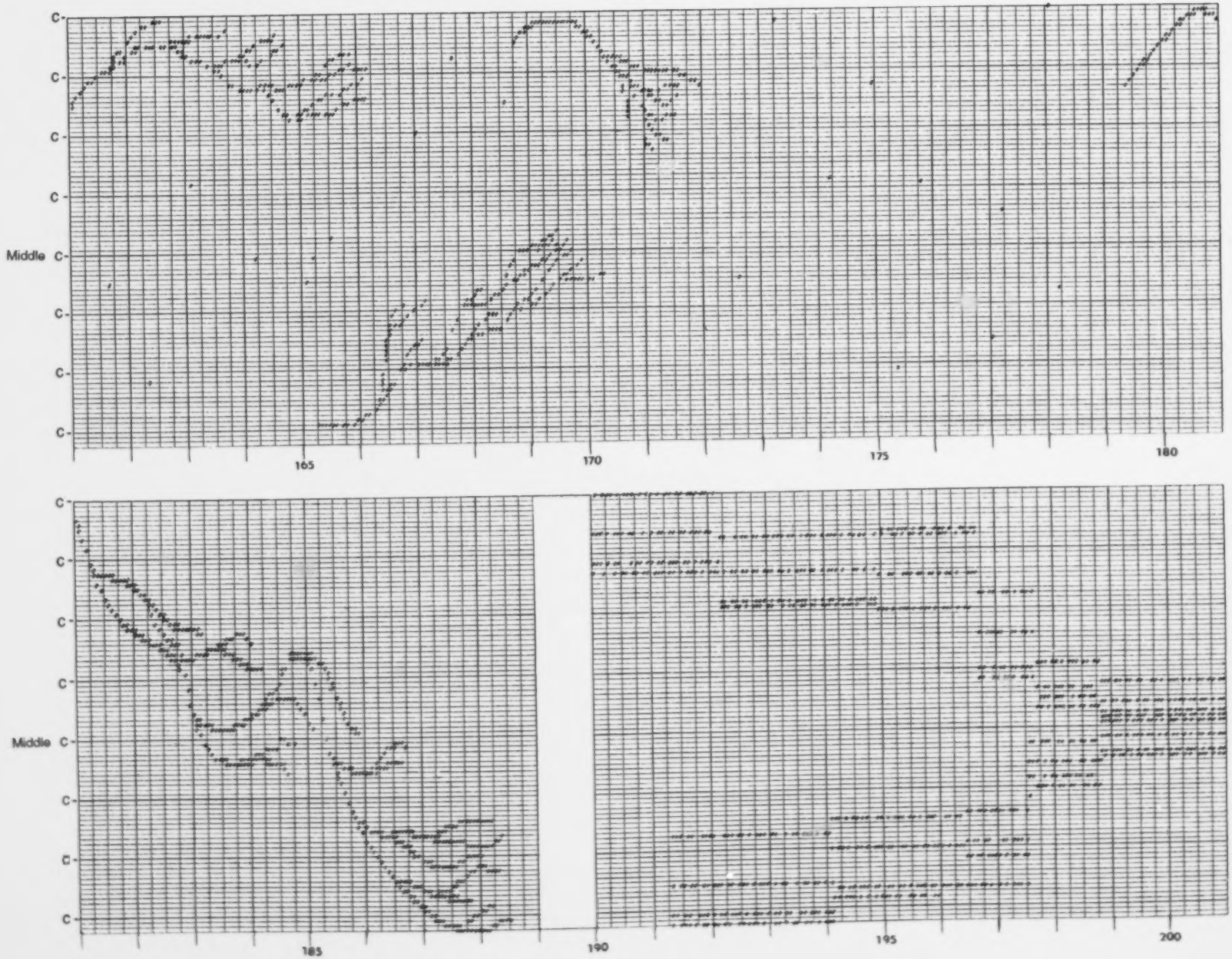
GRAPHIC REPRESENTATION OF *EVRYALI* ON X - Y AXIS

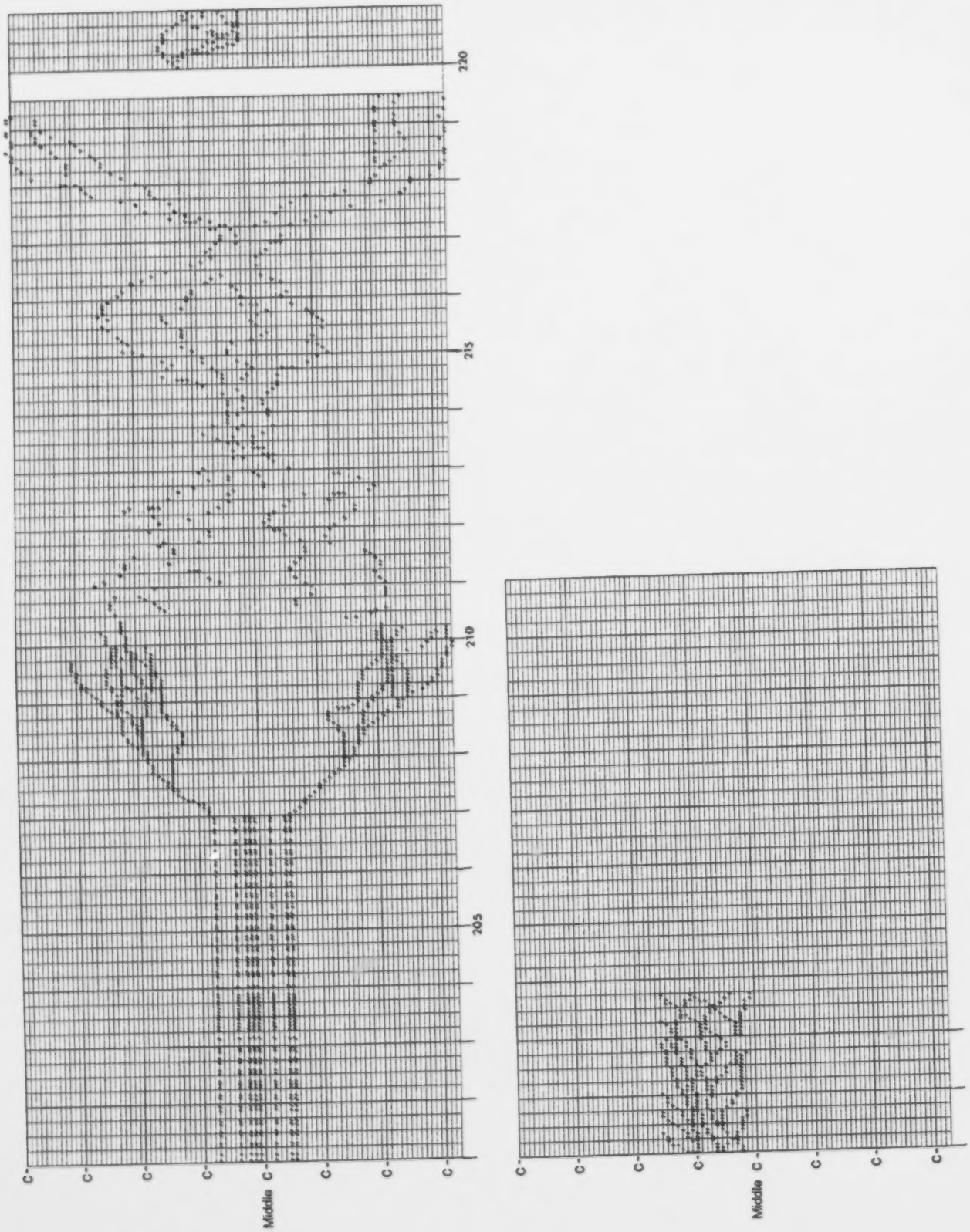



60
55
50
45
C
C
C
C
Middle C
C
C
C
80
75
70
65
C
C
C
C
Middle C
C
C
C


C-
C-
C-
C-
Middle C-
C-
C-
C-
85
90
95
100
105
110
115
120


C
C
C
C
Middle C
C
C
C
125
130
135
140
C
C
C
C
Middle C
C
C
C
145
150
155
160


C
C
C
C
Middle C
C
C
165
170
175
180
C
C
C
C
Middle C
C
C
185
190
195
200


220
215
210
205
C
C
C
C
Middle C
C
C
C
C
C
C
C
Middle C

however, that these sketches do not attempt to recreate Xenakis's original score: they are intended only as a kind of topographical map which allows for a more comprehensive understanding of the spatial dimension, of the textural and registral journey of *Evryali*, an itinerary which has been visually lost in the process of transcription from Xenakis's original conception to musical notation.

The sketches reveal that the entire piece does not consist simply of the alternation of silences, waves, block chords and arborescences: there is additional musical material which must be accounted for, such as the cloud of pitches at measures 136 to 145 which could be mistaken for an arborescence in the grand staff reduction. Furthermore, the sketches confirm some of the musical characteristics which allow differentiation between regional areas of musical activity; these, in turn, provide a rationale for determining formal divisions. The silences and blocks of chords are easily identified. In all instances, arborescences originate with a single pitch and tend to move through the register as individual lines spreading out in various directions. Waves, too, derive from a single pitch, but they move down and up the keyboard in parallel motion.

Unlike Bucquet, both Claude Helffer and Roger Woodward associate *Evryali*, in some degree, with overall formal designs. Apart from one discrepancy which will be discussed in due course, they see in *Evryali* a form which is both classic and balanced. It consists of three main sections of distinctive musical material with a significant but short coda:

	A	B	C	Coda
measures	1-74	75-135	136-219	220-23

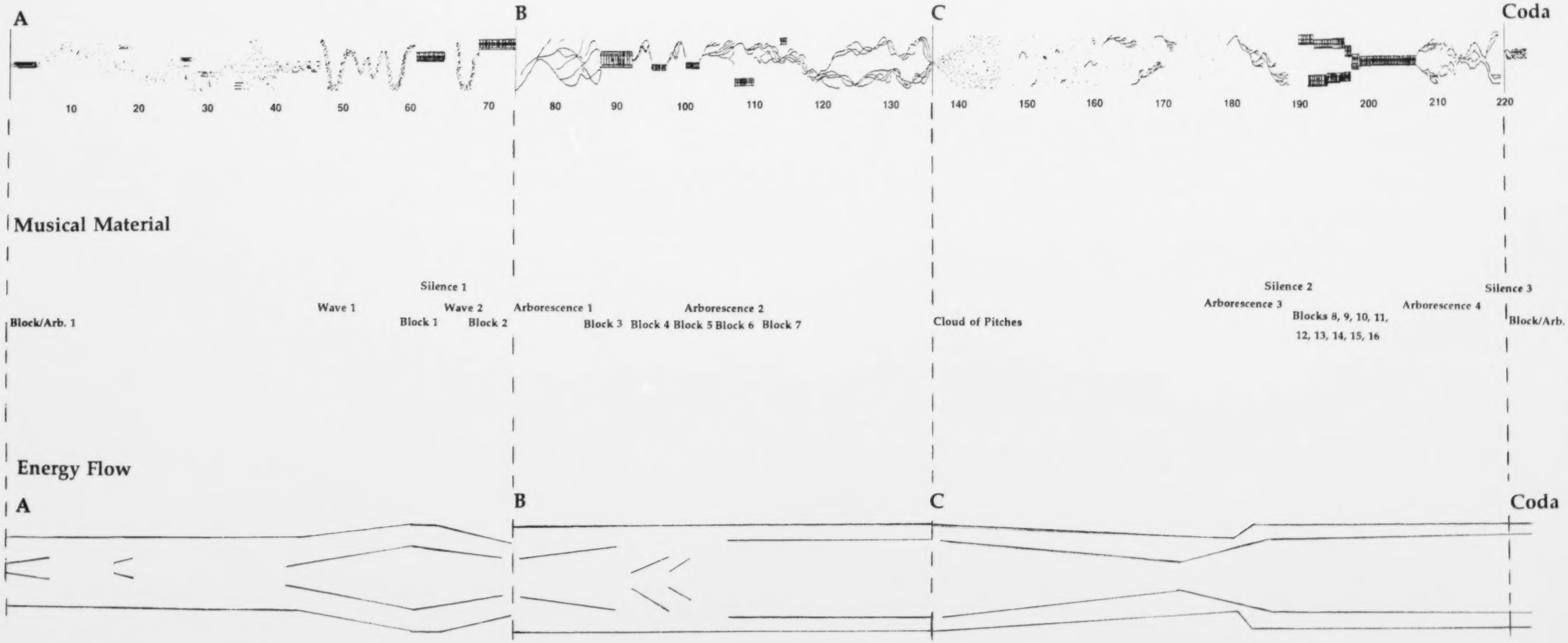
In order to view the entire, uninterrupted journey of *Evryali* a sketch, based on the graphic representations on pages 45 to 50, is shown on page 54. Imposed on to the sketch are the sectional divisions which, to the eye, conform to the formal divisions as suggested by Helffer and Woodward. Each section begins with a single pitch and ends with some kind of rupture, either with block chords which suddenly break off, as at the end of parts A and the Coda, or then with silence, as at the end of the C section. There is no real break at the end of the B section, but there is massive movement towards a single pitch as the pitches at opposite ends of the keyboard at the beginning of measure 135 surge toward the single pitch, E-natural, in measure 136. In general summary it may be said that the A section is distinguished by large waves, the B section by big arborescences and the C section by small arborescences; each section contains blocks of chords, and all except the B section contain silences.

In addition to presenting the itinerary so that individual sections of musical content are clearly delineated, the sketch overview of *Evryali* displays another element of performance significance, namely, the *regions of relative energy* contained within the piece. Energy exists on several levels in various categories and dimensions and consists of combinations of complex elements such as the consistent rhythmic canvas, the changing dynamics, the tension, the rate of change in registral traverse, the percussive demands, the resonant

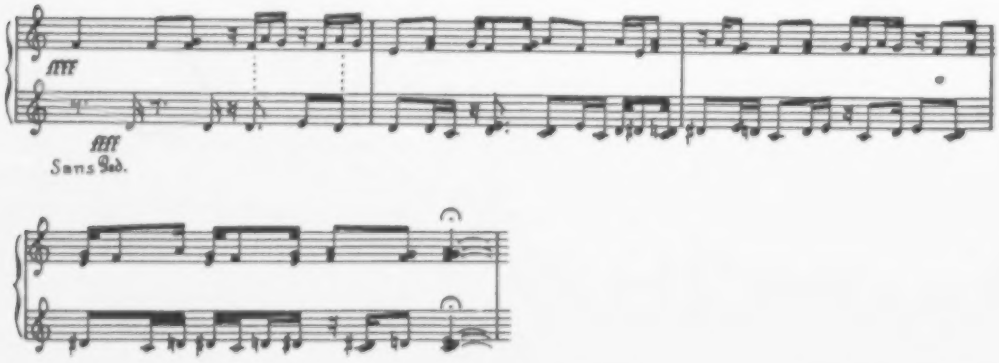
sonorities created by the pedal, the physical complexity, the engagement with the score and the psychological response of the performer. Each performer in any musical performance must work through the relative energy map: in this introductory study, the sketch of *Evryali* serves to locate the regions.

While it is true that a relentless driving force pervades the piece from beginning to end, it is important to note that regions of relative energy are a concomitant feature of the music. In other words, the B section, with the big arborescences, is even more relentless than the A or the C sections. Thus again, in general terms, while this music is texturally-, registrally- and energy-regional on the local level, on the broader level it is maximally energy-regional. In other words, the form of the structural journey through the piece is determined, first of all, within a hierarchical understanding of the music in the context of which elements are consistent, then in degrees of changes in texture, register and energy, and finally, in broad sections delineated by changes of the relative energy-flow of the piece. Beginning with the labelling of the raw materials of waves, blocks of chords, arborescences, silences and the cloud of pitches on the local level, the sketch shows that the discrete sectional divisions as identified by Helffer and Woodward coincide with the overall areas of the ebb and flow of dynamic energy. These regions have been clearly demarcated by *crescendo* and *decrescendo* markings to act as signposts for the energy content.

OVERVIEW OF FORM OF *EVRYALI*



The A section is a kind of exposition which introduces thematic material, small waves and the wonderful, huge wave outlined at measures 47 to 60, and blocks of chords. The first four-measure phrase, classic in its structure and highlighted by the only fermata in the piece, is a critical musical statement. Marie-Françoise Bucquet recognizes this phrase as a *Gestalt*, essential to comprehending the piece as a whole: it is the phrase which, for her, undergoes transformations and permutations throughout the piece.[62] This phrase uses a total of seven pitches, C-natural, D-natural, D-sharp, E-natural, F-natural, G-natural and A-natural, ( ), all framed within a small intervallic span of a sixth (Example 6).

EXAMPLE 6

The phrase begins on one note, F-natural, then becomes more complex, both in rhythm and in density, until the chord is sounded beneath the fermata. The notes which make up the chord comprise only six of the seven notes of the

---

[62] In her article, "*Sur* Evryali," published in 1981, Bucquet makes no reference to the concept of *Gestalt*. However, in an interview, December 16, 1995, she said that in rethinking and revising some of her earlier ideas about *Evryali*, she now considers *Gestalt* to be an important interpretative factor.

phrase, the D-sharp being eliminated.

In the first phrase the pitches are fixed without any extension. The first element is a repetitive drum-like or percussive F-natural which is, at the same time, arborescent: it starts with one note and increases to two, three and four pitches occurring together, until the six pitches are combined beneath the fermata. Within a limited intervallic range, pitches are repeated, while at the same time moving outwards like an arborescence. In other words, two of the musical "seeds" or themes of *Evryali*, the arborescence and the blocks of chords, are combined in the opening phrase.

The introductory phrase gives the impression of a block and certainly the block element exists in it. However, this passage is very different from all the other block chords and no close correlation in the piece could be identified. Primarily, the spirit is different: even though pitches are repeated, the phrase conveys a singing, lyrical spirit rather than the pounding percussive quality of the block chords heard elsewhere.

At measure 16 there is a first explosion of rhythmic energy, an explosion which is repeated, again with a staccato-like rhythm and repeated notes at measure 26. A wave which begins to form is interrupted at measure 36 by music which moves the pulse along, a section Bucquet describes as a "tug-of-war."[63] Bucquet suggests that measures 40 to 46, when broken down, elaborate in another part of the keyboard the same idea expressed in the

---

[63] Interview, December 16, 1995.

opening four-measure phrase. On the last beat of measure 46 to the end of measure 60 the gigantic wave is outlined.

The stochastic phrase at measures 61 to 64 presents another permutation of the opening phrase, but it is more furnished, more absolute and ends with the first major silence, the longest silence, of twelve seconds. In this four-measure phrase there is an elaboration of static elements, eight different pitches, which comprise repeated, fixed events in a percussion-like gesture, resulting in a musical "block" with no forward-moving impetus. A similar permutation recurs from the last beat of measure 69 through the last beat of measure 74, and whenever *ostinati* or blocks of chords appear.

Measures 66 to the third beat of measure 69 present another wave. Starting on the last beat of measure 69, there is a five-measure section of blocks, marked *pp*, at the very top of the piano. Roger Woodward describes this phrase as "an intimate aside which has its own little secret." Woodward explains: "Before Xenakis starts the big arborescences he always gives you a bridge, which sets something up. It's like Shakespeare. Before Macbeth kills the king there is a lighthearted aside, with the drunken gate-keeper making jokes. Then suddenly you are thrown into a momentous event."[64] This insight of Woodward's is an excellent example of a region of localized relative energy: within the A section, measures 69 to 74 comprise a region of less energy than, for example, measures 47 to 60 or measures 61 to 64.

---

[64] Interview, January 3, 1996.

The B section is the first big volcanic eruption. It is signalled by a tremendous leap, from block chords in the higher register, down to the single pitch, A-natural, the lowest note on the piano, and marks the beginning of the first arborescence of the piece. The arborescence begins quietly in the lowest register and then builds in complexity, dynamics and energy until a driving force is reached and sustained mercilessly to the end of measure 135. The sketch gives the impression that there are four separate arborescences in the B section, all of which derive from a single pitch. Alternatively, perhaps this entire section, starting at measure 75 right to the end of measure 135, could be seen as one huge arborescence, interrupted by blocks and flights to the upper parts of the piano. There are five blocks in the B section; the first three occur unaccompanied by any other musical material, while the fourth and fifth occur below and above the concurrent registrally-mobile arborescence. On the last two sixteenth-notes of measure 113, the fifth block in the B section and the smallest block of the piece begins in the upper register, but it does not materialize. Instead, the immense arborescence occurring below it extends downwards and then expands outwards; it flows in waves at opposite ends of the keyboard and finally, at measures 134 to 135 it thrusts inward, with tremendous drive, to the middle of the piano. This is a stupendous gesture, full of energy and movement and may well represent the climax of the piece.

The C section begins with music not found anywhere else in *Evryali.* Like an arborescence, the music emanates from a single pitch, E-natural in the middle of the piano, on the second beat of measure 136. But almost

immediately the pitches move concurrently forwards and outwards so that, by measure 146, the general impression is that of an array of pitches in a cloud. It is as if the force of the impact of the inward thrust of the music at measure 135 on to the repeated E-naturals of measure 136 causes the E-naturals to break apart and fragment into a burst of other pitches. Roger Woodward refers to the ten measures, from measure 136 to 146, as a kind of "bridge": it is a section of music which links the end of the B section at measure 135 with the C section which, for him, begins at measure 146. Together with Woodward's interpretation, Claude Helffer's words are illuminating: "In measures 136 to 146, you have probable distribution--stochastic--but I think he did not calculate it, he simply wrote it. He is so accustomed to writing stochastic music that he did not calculate it. They are points: it is the probable distribution of points, it is not a true arborescence."[65]

Following measure 146 to measure 178 there is a change in texture featuring the utterance of points, smaller arborescences and complete breaks. For the most part, the music of this section is full of spasms and ruptures: as arborescences tend to form, they are continually broken off, resulting in little, fragmentary arborescences. At measure 179 the most significant arborescence in the C section takes shape: it begins on G-sharp three octaves above middle C, moves upwards to the penultimate note of the keyboard and then, within seven measures, moves downwards to reach feverish dynamism in the lowest

---

[65] Interview, December 18, 1995.

register of the piano. This huge gesture is followed by silence. Before and after the silence at measure 189 the opposition of register in the blocks is particularly striking: the movement is from the extreme ends of the keyboard, from the depths to the height.

From measure 190 to the last beat of measure 198 a succession of block chords at opposite ends of the keyboard overlap each other in a kind of chequerboard time-frame, constantly moving towards the middle of the piano, the centre of the overall register. On the last beat of measure 198 they merge in the middle of the keyboard to form an eight-measure block, the most sustained block of the piece. At measure 207 the last big arborescence grows out of the upper and lower notes of the last big block. As it grows outwards, it tends to form blocks in both the higher and lower registers at measures 208 to 210, but these do not materialize. Instead, the texture thins out and the arborescence grows outwards until the extreme registers of the piano are reached. Following this gesture is the final silence of the piece, the only silence which marks a formal division and thereby performs a structural function.

Both Claude Helffer and Roger Woodward refer to the brief section of measures 220 to 223 as a Coda, and certainly in these measures there is a return to opening material which provides overall unity. The Coda begins at measure 220 from a single pitch which, like the opening four-measure phrase, immediately becomes a series of stochastic block chords with inherent or incipient arborescences, although the arborescent movement is much more

prominent in the last four measures. The four-measure Coda balances very classically in length with the opening four measures of *Evryali* and with other four-measure phrases found throughout the piece as, for example, at measures 61 to 64. The Coda is particularly startling in its effect, suddenly breaking off in mid-air, so to speak, as if the statement were not yet finished, while at the same time creating the impression that it would wish to go on forever. It is also interesting to note that the last measure of the Coda is unique, in that it is the only measure to comprise three beats instead of four.

From what we have seen so far, *Evryali* is a composition "fashioned" by mathematics and glued together by a series of waves, arborescences, block chords and one cloud of pitches punctuated by breaks, ruptures and full stops. What may be its meaning? It is worth reiterating that Xenakis does not mention *Evryali* in *Formalized Music*, and while that source provides the philosophical, mathematical and scientific underpinnings for Xenakis's music, it does not necessarily function as a performer's "open sesame." Indeed, neither Bucquet nor Woodward forged a performance strategy or even an enlightened comprehension of the work based on the theoretical explanations in *Formalized Music*. To initiate an uncovering of possible meaning inherent in the music it is salutary to turn, first of all, to the title of the composition.

Chapter IV

"At the beginning it had no name."

Bucquet continues, "Or rather, it had another title in dots which Xenakis kept for himself."[66] Eventually, however, Xenakis christened his composition *Evryali,* a Greek title which has two different meanings: "'The Sea at Large' or then, 'The Medusa'--it does not matter which, but the one with serpents for hair: the Gorgon."[67]

Bucquet's article, "*Sur* Evryali," begins with a description of the venue where Xenakis composed *Evryali,* namely, in a converted farmhouse in Corsica surrounded by the sea. She then declares that, "This is an important thing to know because, even if Xenakis's music is never descriptive, for me this score is tied to the phenomenon of the sea. For the composer it would have been a question more of 'arborescences,' and he who comes close to the work on the formal level will find other avenues but that does not seem satisfactory."[68]

The sea plays a major role in Greek mythology and so it does in the myth of Medusa, the second meaning contained within the title, *Evryali.* The myth really begins with the fear of Acrisius, King of Argos, who has learned

---

[66] Bucquet, 221.

[67] Bucquet, 221. Matossian, 233, translates *Evryali* as "wide sea/Medusa." According to Roger Woodward (interview, January 3, 1996) "*Evryali* means wide sea; and the other thing it means. . . this is what he [Xenakis] said to me in a taxi: 'The Medusa with her head cut off and her tongue hanging out.'"

[68] Bucquet, 219.

from the Oracle that he will die by his grandson's hand.[69] Acrisius therefore locks away his only child, a daughter named Danaë, so that she may never be visited by a man. But Zeus comes to her in the form of a shower of gold and Danaë bears a son named Perseus. When Acrisius learns of the birth of the child he is afraid for his own life but, unwilling to kill the child outright, he puts both mother and child into a chest and sends the chest out upon the stormy sea. Zeus, however, watches over the mother and child: he bids Poseidon still the savage winds and waves, and eventually the chest washes up on the shores of the island of Seriphos. The pair are saved.

Sheltered by a fisherman, Dictys, who treats Perseus as his own son, the young man grows in strength and stature; he vanquishes all his rivals and dreams of greater glory. Now Polydectes, Dictys's brother, is chief of the island. He desires Danaë but Danaë, being interested only in her son's well-being and future, rejects Polydectes. In order to rid himself of the young man and thus gain Danaë's love, the cunning Polydectes sets Perseus a fearsome task: he is to slay Medusa.

There are three Gorgon sisters but only one of them, Medusa, is mortal. Like her sisters, she is terrible to look upon: as punishment for offending Athene, Medusa's hair consists of snakes writhing around a face so horrible that anyone who looks at her is immediately turned to stone.

---

[69] Different sources retell ancient myths with minor alterations; the details for the myth of Perseus and the Gorgon presented here are derived from A. R. Hope Moncrieff's *Classical Mythology* (London: Senate, 1994), 75-86.

Perseus is not afraid of his task; indeed, he welcomes the opportunity to prove his mettle and sets out on his venture. Perseus is not an ordinary mortal: he is a demi-god who receives advantages befitting his elevated station. For this challenging undertaking the gods Athene and Hermes favour him with special gifts: winged sandals to allow him to fly swiftly over land or sea; a magic helmet to make him invisible; Athene's polished shield; Hermes' crooked sword; and a goatskin bag to hold the slain Medusa's head.

Thus armed, Perseus journeys to the north country to seek out the frostbound Griae (the Grey Sisters), half-sisters of the Gorgons, who alone know the way to Medusa. The Grey Sisters are a feeble lot, three very old hags clothed in their own hair, who have only one eye and one tooth among them. Wearing the magic helmet, the invisible Perseus snatches their one eye and threatens to steal their tooth unless they tell him the way to the Gorgons. They mumble out the directions, so he returns their eye and then flies south to the island of the Gorgons.

There he finds the three sisters sleeping. To avoid looking directly at Medusa's face the clever Perseus uses Athene's shield as a mirror. Then, with one powerful blow from Hermes' sword, the deed is done with lightning speed. The brave Perseus is victorious! To protect himself from inadvertently looking at Medusa's face, he deposits the head into his goatskin bag and leaves the island of the Gorgons.

It is always a risky business to infer particular meaning from an abstract title, whatever the art form, but in this instance, *in the title alone*, Xenakis has

given the interpreter a great deal to draw from. It is quite possible, for example, to interpret *Evryali* as Bucquet suggests, "tied to the phenomenon of the sea." It is not difficult to hear resonating in Xenakis's creation the sounds of the sea unchained, the great forces of nature, the winds and the pounding waves, storms and squalls, ruptures and moments of pregnant quietude. In such an interpretation, the entire piece could be viewed as a magnificent seascape, in which waves struggle against chords and chords struggle against waves. Some of the waves are fully formed, others "grow" into arborescences; they both pound against craggy cliffs (the block chords) or then suddenly give way to peaceful atmospheric changes (silences, rests), as typified in nature. For Bucquet, the image of the sea and the waves brought her closer to the music:

> I always thought I was thrown into the middle of a very wide sea, in a tempest, as one finds in Greece; because I had lived in Greece, that image was very eloquent. Once we were in a boat and we couldn't come home and I was quite frightened . . . . The idea of arborescences didn't help me, but the associations with the sea helped me grasp where I wanted to go with the music. And it's both physical and mental, all of this imagery.[70]

If *Evryali* may be interpreted as a programmatic seascape, is it not equally plausible to hear it as a programmatic depiction of Perseus's victorious quest for the Gorgon's head? Is it possible that, within the warp and weft of this mathematically-conceived Twentieth-Century composition, Xenakis has

---

[70] Interview, December 20, 1995.

interwoven a myth from his classical Greek heritage? Are there moments when the forces of both nature and myth co-exist? The sleuth must look to the composition for clues.

The first crucial evidence may be found in the opening four-measure phrase, the tiny section which Bucquet considers to be the very heart of the composition, the source of the *Gestalt*. This music poses a special interpretative problem: its delightful dance-like character is consistent with neither the indomitable forces of the sea nor the exigencies inherent in the slaying of the Gorgon. But is there not in its gaiety both clement Nature and an echo of the mirth, the trickery and the sheer inventiveness of Zeus's appearance to Danaë as a shower of gold? With this latter interpretation of the first musical phrase as a starting point and with the pictorial aid of the graphic representation on page 54, the myth of Perseus and Medusa is played out.

The A section introduces the tale. The opening measures relate Zeus's visit to Danaë and the birth of Perseus (measures 1 to 24), then the discovery of the child's existence and Acrisius's decision to send the mother and child off to sea in a chest (measures 25 to 40) and, finally, the journey at sea (measures 41 to 74).

The B section depicts the growth of Perseus from a child to a young man (first arborescence, measures 75 to 88), followed by his initial clashes with rivals (first three blocks of chords) within an otherwise peaceful existence in which the love of Danaë for her son flourishes. This idyllic period (fourth arborescence, measures 102 to 134) is interrupted by the intervention of

Polydectes and his scheming ways (fourth and fifth blocks of chords), but the love between mother and son prevails as Perseus grows to maturity, accepts the challenge of Polydectes, prepares himself for his task and finally sets out on the frightening journey (measure 135).

The C section opens with a portrayal of the numinous presence of the gods as Perseus experiences a favourable meeting with Athene and Hermes (cloud of pitches, measures 136 to 146), his flight to the north (measures 147 to 158), his clever tactics in successfully eliciting from the Grey Sisters the location of the Gorgons (measures 159 to 170), his flight to the island of the Gorgons in the south (measures 171 to 185), and the use of his weapons and his wits as he slays Medusa (measures 186 to 188). "If there is legend in *Evryali*," says Roger Woodward, "there is an actual slaying of the Gorgon's head in my performance--there is one chord, and if you do not play it correctly you have problems with your life." Woodward identifies "the penultimate semi-quaver in measure 187 among the white chords," as the exact moment he slays the Gorgon.[71]

This brings the musical journey to the last great silence at measure 189. At measure 189 the composition does not end, but then of course, neither does

---

[71] Interview, January 3, 1996. At this point in the interview Woodward related the astonishing fact that there have been physical accidents with people who play Xenakis: "There is an entire history of people falling off stages and breaking their back, breaking their arm, breaking their finger . . . there is always something breaking." This confirms an earlier statement in which Bucquet claims that some of her students are reluctant to play Xenakis's music because of "all the accidents" (interview, December 16, 1995).

the myth.

On his return journey to Seriphos the weary Perseus encounters the great giant, Atlas, and requests rest in Atlas's garden of golden apples. The anticipation of the meeting of these two great protagonists, one god and one demi-god, is metaphorically described as the blocks of chords move from the extreme opposite registers of the keyboard to merge in the middle register where they finally encounter one another (measures 190 to 198). When Atlas rudely denies his request, Perseus reveals the head of Medusa and Atlas is immediately turned to stone (block chords, measures 198 to 206). On the next leg of his homeward odyssey the invincible Perseus discovers the beautiful maiden, Andromeda, who, to satisfy the sacrificial demands of the Oracle, has been chained to a rock to be devoured by a sea monster (beginning of arborescence, measures 207 to 210). Perseus falls in love with Andromeda (arborescence, measures 211 to 218) and, in a great display of strength, slays the monster (block chords, 220 to 223). At this juncture the music ends.

It is difficult to account for the last measure of music in *Evryali*. To begin with, it contains only three beats when four would have been predictable; and secondly, taken together with its preceding three measures, the music conveys the impression that the music is cut off, unfinished, *in medias res*. Roger Woodward pointed out that this gesture, in which a thin veil is drawn over the end to create an enigmatic impression, is very often found in

Xenakis.[72] If the interpretation of a seascape is convincing, the ending could well suggest the pounding waves cut off, as it were, in their full unstoppable journey to infinity. But this ending, atypical in its abrupt fracture, is also the second powerful musical element to lend credence to a mythical interpretation of the music: the myth, too, is unfinished and the slaying of the Gorgon has still deeper repercussions in the life of Perseus. And so the myth continues.

At the joyous wedding feast of Andromeda and Perseus, the celebrations are suddenly interrupted by an armed group claiming the bride on behalf of their leader, Phineus, to whom Andromeda had been promised. When Perseus points out that Phineus had done nothing to rescue Andromeda from her plight, a battle ensues in which it appears that Phineus and his men will prevail. Once again Perseus reveals Medusa's head and turns his opponents to stone.

The head of the Gorgon provides one last episode for the myth. Upon his arrival in Seriphos, Perseus finds his mother, Danaë, enslaved by Polydectes. In angry response to the drunken Polydectes's mocking query about Medusa's head, Perseus reveals the head for the last time: Polydectes and his motley crew are immediately turned to stone. The gentle Dictys is instated as chief of the island, Perseus returns his magic gifts to Athene and Hermes, and the Gorgon's head is transformed into a boss in Athene's shield.

To bring the myth to its conclusion, Perseus does in fact kill his

---

[72] Interview, January 3, 1996.

grandfather, Acrisius. The accident takes place at a sporting event in which Perseus is competing while Acrisius is among the spectators: as Perseus throws the discus, a sudden gust of wind changes its course and hurls it into his elderly grandfather. The blow is powerful enough to end his life.

There is, in recounting the last dramatic portions of the myth, plenty more material for waves, arborescences and blocks of chords, all of which have been cut off in the last measure of the coda.

This mythical interpretation proposes an intimate connection between the music and the mythical events by *imposing* definite programmatic elements on to the music. Such a close reading of a musical text is dangerous and, perhaps, not even desirable. However, within the context of *Evryali,* it is intended to emphasize, literally, the close relationship which exists between Xenakis, his Greek heritage and his music. The fact that Xenakis has elected to dangle a knife in his studio--"the sword of Damocles to remind him of the passing of time"[73]--is evidence that each passing moment of his existence is somehow connected, both physically and metaphysically, with the richness of his Greek culture. In the mythical reading of the music, the waves have strong associations with the sea, the block chords correspond to various forms of confrontation, and arborescences are symbolic of growth. The arborescences symbolize growth, not only in the natural sense of a boy growing to manhood, for example, but also of growth in other attributes such as wisdom, happiness,

---

[73] Matossian, 11.

love, and recognition of innate abilities, talents and powers. Like the blocks, the arborescences often convey the impression of struggle, but this comes as no surprise: rarely is there growth without the pain of struggle.

In the informal setting of his home, Roger Woodward commented that the composer "would probably laugh his head off"[74] if he could hear us trying to unravel meaning in *Evryali*. Perhaps he is right. Nevertheless, it is the responsibility of the interpreter to ferret out meaning in a work of art and, like every great work of art, *Evryali* speaks on many different levels. The formal surface-level analysis, discussed at length in Chapter III, uncovered what could be described as a constructive principle of antithesis: there is the juxtaposition of dynamic and static elements, the opposition of forces, the sonorities of the low end of the piano against the high end of the piano, of *forte* against *mezzo-forte* or *pp*, and of pitches in the low register against the high register. These could be interpreted as lightness versus darkness or as good versus evil. On the surface level, too, interpretative readings seem to be encouraged: in giving the composition the title *Evryali* Xenakis has offered two equally-plausible possibilities. But, at a deeper level, may something else be discovered?

In the closing remarks of her monograph, Nouritza Matossian concludes:

> No matter what musical form or conceptual ideas might inspire his music, a composition is a metaphor for battle . . . Xenakis has never stopped being a Resistance fighter. He simply moved his

---

[74] Interview, January 3, 1996.

> field of battle into music, he transformed physical and political combat into the struggle of ideas and sounds and therein forged his own aesthetic with a lyric passion . . . .[75]

These are powerful words. They suggest, first of all, that Xenakis's works are intimately connected with his Resistance activities, experiences which are carved into his physical, intellectual and emotional reality. Matossian's viewpoint is confirmed by Xenakis's close friend, Maurice Fleuret:

> . . . one can perceive in his music--and on his own admission--the immediate echo of battle: the heavy grinding of tanks, the report of automatics, the whistling of tracer bullets, all the explosions of the Apocalypse. It is rather as if his born musician's ear had straightway seized upon these sonic assaults to defuse them, exorcise them and transmute their substance.[76]

How could it be otherwise? Combative associations of immense variety are created by the sonorities in *Evryali*. It would be equally persuasive to read the piece as representative of some of the great conflicts in the history of civilizations, in the world's political and social struggles: those blocks of chords, those pregnant silences filled with frantic anticipation, those sporadic skirmishes and those dynamic arborescences are all apposite.

Xenakis's description of himself must also be borne in mind. His own phrase, "I am . . . a classical Greek living in the twentieth century"[77] argues

---

[75] Matossian, 244.

[76] Maurice Fleuret, "Xenakis: A Music for the Future" in *Music and Musicians*, 20 (1972), 21-22.

[77] Matossian, 197.

most persuasively for a mythical reading of *Evryali*. This self-revelatory statement, as the second part of Matossian's insight suggests, is representative of Xenakis's unending struggle to entice musicians back to the basics, back to the ways of the ancient Greeks, back to the great myths, back to truth. Using his Greek roots as the foundation, he has built a musical architecture implementing Twentieth-Century mathematics and science. To approach Xenakis's music without considering the impulsion of his Greek heritage is equivalent to analysing the music of an opera in the absence of the text or, alternatively, to analysing the text of an opera in the absence of the music. The two co-exist in such a way that they are completely dependent upon each other: they are indivisible. In short, Xenakis's Greek-ness is the essential "stuff" of his creative *anima*.

There is yet another important ancient Greek tradition which surfaces frequently in discussions about Xenakis and his roots: the challenge and the spirit of the Olympian.[78] The Olympian and the Olympic Games celebrate the struggle for perfection and participation in the contest as much as they celebrate the beauty of the human body, the champion, the achievement and the victory. This concept of the athlete performing at the optimum in demanding competition constitutes an integral component of the Xenakian consciousness: it is absolutely critical to the performance of *Evryali*.

---

[78] Marie-Françoise Bucquet, Claude Helffer and Roger Woodward all mentioned the importance of this concept in interviews conducted between December 15, 1995 and January 3, 1996.

Chapter V

"*Citius, Altius, Fortius*!" The ideal of the new Olympic Games of 1896 was expressed in a motto coined by the French educator, Father Didon, a year earlier. It is significant that the Latin is in the comparative degree, not the superlative: it implies that success is measured in terms of improvement on previous achievement--one's own as much as someone else's. The motto encapsulates the most important element of the Olympic spirit: not the winning but the striving. Victory is accorded laurels, of course, but nothing detracts from the personal struggle.

Taken together, the concepts of the athlete and the challenge of the individual to transcend personal limitations fashion an underlying theme in many of Xenakis's compositions. But this theme was not born with *Evryali*: it was present in Xenakis's creative laboratory years before and upon occasion it emerges.

By the time *Evryali* was composed in 1973 Xenakis was already an established musical figure: he had composed over forty major works; he had experimented with and written about a variety of compositional techniques; and his major philosophical and theoretical treatise, *Formalized Music*, had been published in both French and English. Furthermore, his compositions were being performed, not by fledgling musicians, but by some of the most gifted and recognized musicians in the sphere of Western classical music.

Although the majority of his compositions were scored for ensembles or

large orchestras, *Evryali* was not Xenakis's first solo work, nor was it the first composition in which the piano was prominently featured: it was preceded by *Herma* (for piano) in 1961, *Eonta* (for piano and five brass instruments) in 1963-64, *Nomos Alpha* (for cello) in 1966, *Synaphai* (for piano and orchestra) in 1969, and *Mikka* (for violin) in 1971.

As early as 1964, "impossible" features in the performance of Xenakis's compositions began to surface. In her monograph Nouritza Matossian quotes a letter to Xenakis from Pierre Boulez, who was preparing to conduct the première of *Eonta*:

> I have received the score and parts of *Eonta*, but I feel I must tell you frankly that the problem is not where you see it in the willingness of the musicians and the number of rehearsals. There are physical limits to the capacity of lips, and the score as it is conceived--I assure you that I looked at it very carefully this time--is *absolutely unplayable correctly* [italics: mine] if one does not relay the instrumentalists. But to give you a comparison, I think that one could play your score like a relay-race, that is to say you can do performances by relay which you could not do with a single runner alone . . . especially when you alternate entire pages of held notes in high registers with entire passages of solo, which jeopardise all security for the embouchure.[79]

To give Boulez his due, Matossian refers to his solution to the performance problem in *Eonta*, "as ingenious as it is unparalleled in the history of music."[80]

Originally, there were apparent problems with *Herma*. In her article,

---

[79] Matossian, 178.

[80] Matossian, 178.

"*Sur* Evryali," Marie-François Bucquet speaks of the "sonorous cataclysm" at the end of *Herma* and then relates this anecdote:

> Xenakis had shown this ending to a certain number of pianists who declared it unplayable by one pianist alone, and that had staggered him for a moment. And what amused me is not only that it had been played--and played well--by Takahashi, very quickly, but that actually students at American universities where I give seminars execute it without any problem.[81]

The point here is not that young American pianists are necessarily superior, but that the playability of a musical phrase at one time perceived to be impossible is later found to be possible. It is important to note that all three of the pianists interviewed for this study were of the opinion that *Herma* is physically manageable.

In the introductory section of the score of *Synaphai*, Xenakis's instructions to the pianist begin with the phrase, "The pianist plays all the lines, if he can."[82] And there is good reason for Xenakis's consideration: at times there is music for the pianist notated on nine, ten and eleven staves simultaneously!

Thus, long before *Evryali*, the precedent for physical performance difficulty in Xenakis's works had been acknowledged. It was obviously with some degree of confidence that Paul Griffiths could write in his 1981 monograph, *Modern Music*: "Peter Hill has suggested that Xenakis's writing for

---

[81] Bucquet, 223-24.

[82] Xenakis, *Synaphai* (Paris: Salabert, 1969), iii.

solo instruments, and particularly for the piano in . . . *Evryali* (1973), defies accurate performance."[83]

It has already been established that Xenakis took piano lessons in his youth; it is also significant to know that he prepared for his composition, *Nomos Alpha*, by playing the cello. Xenakis, then, must be aware of the physical exigencies involved in performing his music. Citing the example of Xenakis's playing of the cello, Matossian declares that Xenakis first made himself "familiar with its particular range, qualities, attacks," then *experimented to extend them*. Nonetheless, she concludes: "It is undoubtedly true of this composer that an extremely pragmatic attitude to instruments accompanies his theoretical propensity in composition."[84]

The question of whether or not a composer plays one instrument or another is a moot point. In creating a composition Xenakis has responded to his vocation as composer by notating the sounds which he hears; the realization of the music is the performer's vocation. And the performer of *Evryali* must be an Olympian.

---

[83] Griffiths, 236.

[84] Matossian, 190.

Chapter VI

In 1975 Peter Hill published an article in *Tempo* entitled, "Xenakis and the Performer." As a pianist who had already performed *Evryali* at Wigmore Hall, Hill was concerned about the duality he perceived to exist between accuracy and physical impossibility:

> It should be clear by now that 'accuracy' takes on a new meaning in this music, partly as Xenakis, by laying out certain chords so that they lie well beyond normal stretch, has built into his notation the element of genuine impossibility. In this way he has ensured that each performance will become an attempt at an ideal but unrealizeable perfection. The musician is therefore like an athlete who, in terms of measured achievement, can only aim for improvement, not at some objective goal.[85]

To demonstrate the element of performance impossibility, Hill set out four problematic passages, one from *Herma* and three from *Evryali*. He then posed detailed possible solutions which included a reduction of the score, octave transfers and the omission of certain notes which he considered to be unreachable. Ultimately, Hill concluded that:

> . . . the details of Xenakis's music which concern the interpreter are the product of chance, a chance which is however the result of calculation, not of improvisation. This method of composition implies that the accurate rendering of the detail of the scores is important. But if this is so, why does Xenakis choose to write music in which literal accuracy is often impossible?[86]

---

[85] Hill, 19.

[86] Hill, 22.

While Hill's essay represents his genuine attempt to come to terms with some of the physical problems involved in the execution of *Evryali*, it sparked a controversy: in one of the next issues of the periodical, in "Letters to the Editor," Yuji Takahashi and Stephen Pruslin spoke out heatedly against Hill's views. Unfortunately, Hill's critics did little to enlighten the musician in terms of approaching and executing these difficult passages; in fact, their criticisms constitute reactions, not solutions, to the problems at hand.

Pruslin and Takahashi contend that there is no genuine impossibility in *Herma*, a point which has already been acknowledged in Chapter V. Beyond that, however, Pruslin takes issue with all of Hill's suggestions about *Evryali*, without offering any practical alternative solutions. Takahashi's reaction, as vitriolic as Pruslin's, begins with a query:

> What, after all, is impossible in . . . *Evryali*? The hands cannot reach those pitches in time, therefore the performer can only try his best to attain the distant goal like an athlete or ascete? This is a dangerous view.[87]

His solution to the physical exigencies is as follows:

> A pianist is not just two hands. He also has two ears. And these ears recognize the sonority of each cloud that changes its colouring incessantly. It is a sort of generalized harmony (or the harmony in the ancient sense). Listening to it guides the performer throughout the performance. (It is the other side of the coin. Ears and hands collaborate in a feed-back loop.)[88]

---

[87] Takahashi, 53.

[88] Takahashi, 53-54.

In its starkness, Takahashi's solution suggests that in listening to the music the physical problems will somehow dissipate, thereby allowing the performer to span the difficult reaches and leaps demanded by the music. But his concluding remarks are enigmatic in the extreme:

> In Hill's article, the image of the composer appears so high above that of the performer that he might be a platonic Creator specifying the ideal form of the world. This is merely a most academic reflection of the common view that a performer is nothing but a slave of his instrument. A performer is an adventurer who explores sonic nebulae following the star map provided by the composer. A composition is a model which is used again and again to open the door of perception. It will be modified, if necessary, and discarded when it is no longer valid.[89]

With these words Takahashi seems to suggest that, because a performer is on equal footing with a composer, the player can "modify" a composition "if necessary." This viewpoint is not only diametrically opposed to Pruslin's contention that "a player must be ready and able to cope with the vicissitudes of a particular performance,"[90] but actually coincides with the very tack that Hill took in the first place!

This controversy is useful as a starting point in the discussion about performance practice, because it frames the main issues involved in grappling with the practical problems inherent in *Evryali*. But it is necessary at the outset to acknowledge that the first major problem lies in the visual representation of

---

[89] Takahashi, 54.

[90] Stephen Pruslin, "Letters to the Editor," *Tempo*, 115 (December, 1975), 54.

the score. Both Marie-Françoise Bucquet and Roger Woodward insist that the music not be played as a reduced chordal presentation, with the attendant dangerous concomitant of *sounding* like music in a different idiom, like a "Xenakis toccata," to use Woodward's phrase.

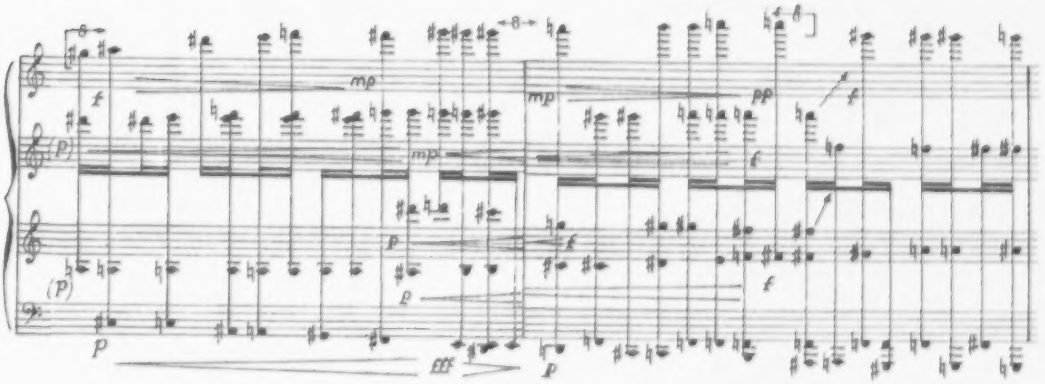
This is the reason why a grand staff reduction, such as the one presented on pages 26 and 27 serves only a limited application. In the context of an introductory overview it is useful initially to grasp the feel of the rise and fall of the sounds; it enables the organization of a plethora of notes and staves into a comfortable, compact format; it reveals patterns; it helps to delineate sections of music from other sections; and it facilitates easy reference. But the notational format Xenakis has chosen for *Evryali*, with concurrent use of several staves, is part of the essence of the piece: it attests to Xenakis's hearing of sounds rising and falling in a way unique to him. Performance *difficulties* and performance *solutions* are separate issues. It matters not how (unnecessarily) complex the score appears; the composer made a conscious choice and his notation must point the way to the effects he wishes to achieve. In this matter Woodward's opinion is well worth repeating:

> Iannis is presenting the work as he hears it in his own incredible way, and this is what concerns me. In a musical sense, a reduction removes the moral high-ground from his means of hearing; it diminishes what he hears. In the business of learning the piece, each performer must find his or her own way. If it means initially reducing the music to two staves, so be it, but only for private working purposes. As a matter of respect to the composer, it must be borne in mind that a reduction destroys the big feel of the work, his avalanche; it

reduces *Evryali* to snowflakes.[91]

The music in *Evryali* is *not* chordal and, in a very real sense, a chordal presentation destroys the individuality of the lines. In the technical realization of the piece, the linearity of the voices and the clashing of the sonorities must be preserved.

The first difficult excerpt which Hill presents from *Evryali* consists of measures 81 and 82 from the 1981 Salabert score (Example 7).

EXAMPLE 7

Marie-Françoise Bucquet had been blissfully unaware of Hill's article, a fortunate circumstance which permitted observation of her totally spontaneous reaction. Her reaction to his selecting of measures 81 and 82 was both swift and surprising. She said, "What's difficult about that?" and then, in a display of pyrotechnical skill, she played the two measures with all the notes written by Xenakis. The ease with which she executed the two measures generated a

---

[91] Interview, January 3, 1996.

stunned reaction; she responded with an exceptional teacher's technical explanation.

Bucquet's training method dictates that, for the leaping passages, finger memory and spatial presentation have to be found, not in the fingers but in some memory of kinetic consciousness. For Xenakis a performer must be able to articulate notes at opposite ends of the keyboard without being afraid of the distance between them. It is of prime importance for the hand to be so natural and sure of distance and space that to leap two, three or four octaves becomes a kind of stereotypical, memorized or "metabolised" gesture. In other words, the execution of two consecutive notes, for example, C in the lower register and D in a register three or four octaves higher must be just as agile and adroit as the execution of a C and D found right next to each other. For Bucquet, the movement from C to D a whole tone apart, is the same as from C to D three octaves apart; her hand recognizes the three-octave leap as though it were "next door." For her, another part of the body, which has memorized the distance, is at work.

In Bucquet's rubric, this technique is the basic training absolutely necessary for those arborescent "jungle passages with the liana or ivy going everywhere."[92] Bucquet likes the analogy of the jungle because it conveys the idea of walking in either thin or dense foliage when suddenly it is necessary to leap or fly through the air. She contends that it is possible for a pianist to

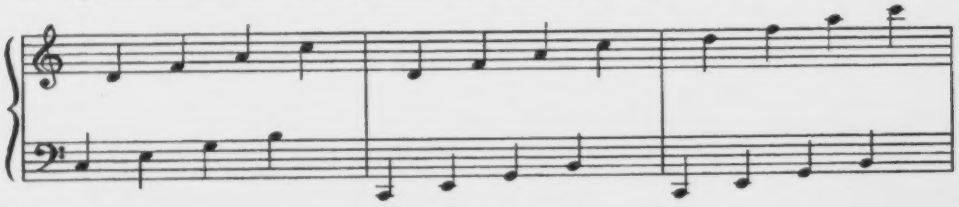
---

[92] Interview, December 15, 1995.

train the mind and build up other reflexes which make the leap from C to D three octaves away as familiar as if they were pitches next to each other. This method appears to abolish distance, so that the representation of the keyboard is not consequent; and the music requires that nearby relationships and combinations familiar to the tonal repertoire be eliminated.

Bucquet insists that the idea of being able to jump from one note to another, on another level of awareness, has to be built up. It can be studied and practised like a scale, first with the space of one octave, then two octaves, then three, as shown in Example 8.

EXAMPLE 8

To be practised: 1) with the right hand throughout; 2) with the left hand throughout

She says that this technique involves space memory:

> It is like bowing and it is like singers who do not have their notes fixed on their noses or on their mouths. It is a technique that must be practised, but it is also a question of not being afraid of emptiness, of the great void between the pitches. Apart from the visual representation it is one aspect, a technical element, which can be made easier. It is necessary to find, kinetically, an answer within the body which provides an alternative perspective to the finger-to-finger relationship. Maybe the concept of bowing could be a good idea, but then it would have to be a very big cello.[93]

---

[93] Interview, December 15, 1995.

Bucquet's solution is invaluable in practical terms because performers can train themselves to make it work. Success with this technique is achieved when the mind and body perceive the keyboard in a profoundly new and different view, so that the body takes care of the leap by cancelling *the idea* of the leap; it does not, of course, cancel the gesture, but it cancels the *mental operation* which believes the distance to be far. Embedded in Bucquet's technique is the idea of the athlete's leap, overcoming the frightening prospect of the abyss.

For the logistics involved in executing a difficult measure, Bucquet advocates a kind of geographical recognition of how the action and the direction of the action are going to evolve. In measure 81, for example, there are eight A-naturals in the alto voice. The thumb of the left hand plays the eight A-naturals but, at the same time, the entire hand must be aware of making combinations with the descending bass line, from C-sharp to F-sharp: one A-natural alone, four A-naturals in combination, one A-natural alone, and so on. As the music proceeds through to measure 82, it becomes more complicated because the alto voice rises. The hand must recognize the rising chromatic scale as an anchor: "In those difficult passages you always take what is to be a kind of mattress for your comfort, something which is going to be regular, which is going to be reliable."[94]

In demonstrating the execution of leaps Bucquet uses the images of the

---

[94] Interview, December 15, 1995.

trampoline and the anchor: "It is important to think that leaps come from where you have put your anchor."[95] If the anchor is in the middle voice, the leap originates in the middle voice and returns to the middle voice; if the anchor is in an outside voice, the leap is from the outside to the inside and back to the outside. In the instance of measures 81 and 82 the jumps from and back to the centre of the piano support physical balance.

When Bucquet was shown Hill's solution she said, "That's easy. I could memorize that in a minute, it's just like Beethoven." She then turned the page over and played Hill's solution. This brief exchange illuminates a critical aspect of *Evryali* and of Xenakis's compositions in general: there must never be a cross-over between genres. Bucquet's main objection to Hill's solution was not that it was easy to memorize and to execute but, rather, that it offers an anachronistic solution. Believing that Xenakis is challenging the performer with non-pianistic writing, she rejects a solution which amounts to pianistic cliché: "I prefer the risk of inaccuracy, I prefer the challenge of the written score. To reduce it to a combination which is classical for the hand is a pity."[96]

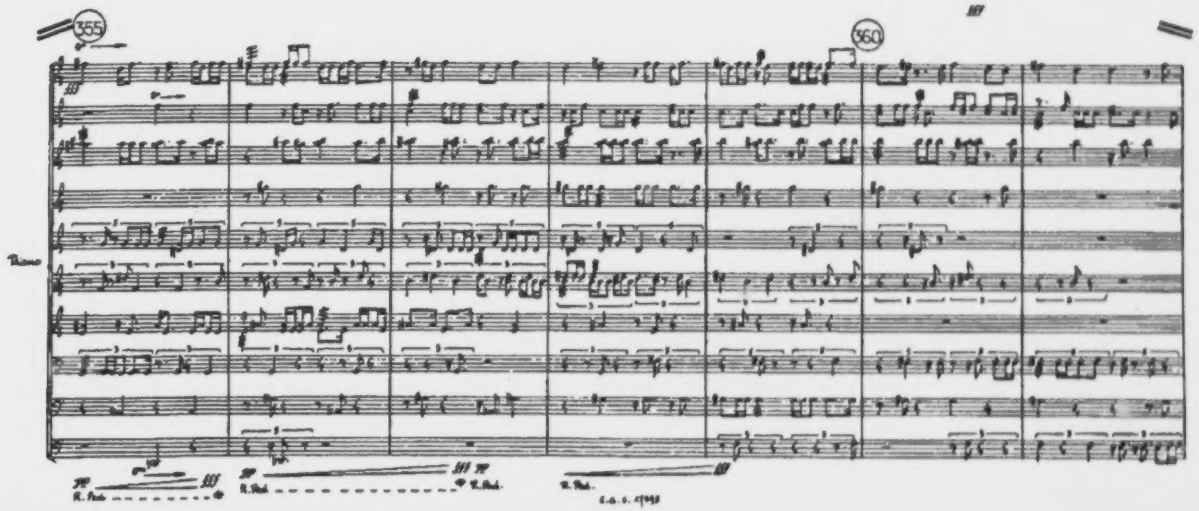
Xenakis's treatment of music in other pieces attests to the importance of a non-chordal approach. An excerpt of the piano part from *Synaphai* demonstrates the essential linearity of Xenakis's writing and the finger

---

[95] Interview, December 16, 1995.

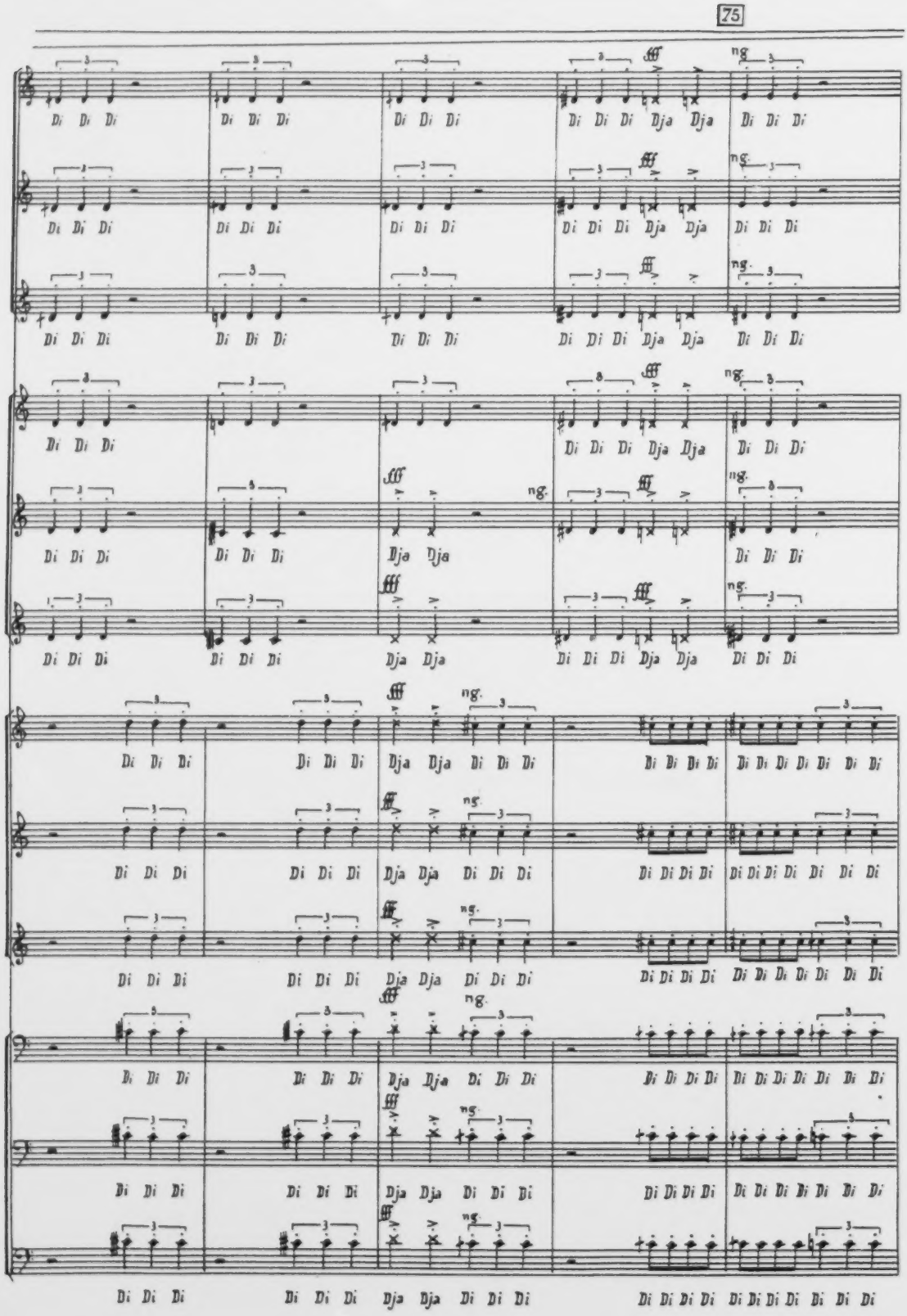
[96] Interview, December 16, 1995.

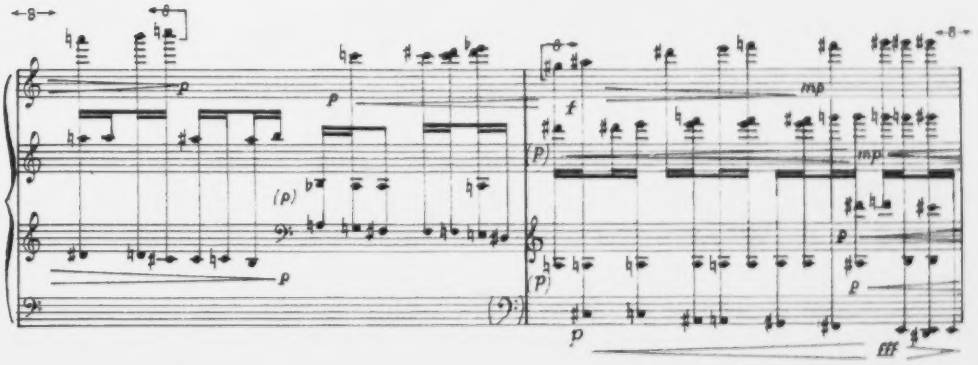
independence required by each voice (Example 9).

EXAMPLE 9

The linearity of the polyphonic writing in *Nuits*, a vocal piece for twelve individual soloists, draws on the "sumptuousness of twelve individual timbres" (Example 10).[97]

---

[97] Marcel Couraud, "Des *Cinq Rechants* de Messiaen (1948) à *Nuits* de Xenakis" in *Regards sur Iannis Xenakis*, ed. Hugues Gerhards (Paris: Stock, 1981), 190.

EXAMPLE 10

Roger Woodward's reaction to Peter Hill's solution of measures 81 and 82 was instantaneous: "Leave it alone. Leave what Xenakis has written alone. If you can't play it, play it the best you can."[98] He acknowledged that it is a difficult passage and then presented his own solution. Since the score dictates that the tempo is *approximately* 60, he begins to slow the tempo at measure 80 and then deliberately builds it again, so that by measure 87 the original tempo is reinstated. He advises against suddenly slowing the pace at measure 82 because of the tenor voice which begins at measure 80 (Example 11).

EXAMPLE 11

By the time measure 82 is reached, the tenor line is at C-sharp, in the middle of a rising gesture and the tempo therefore cannot suddenly be pulled back. When asked if he could manage to play all the notes, Woodward's response provided an insight into his view of a composition in general and into *Evryali* in particular:

---

[98] Interview, January 3, 1996.

> You have to. This is not a little piano piece to be played cosmetically, it's a great work of musical art. You must not change what the composer writes; that's the law, isn't it? It's in stone, forever. You *must* play all the notes.[99]

In terms of how he achieves this, he says that the most important thing is to place the thumb of the right hand on the tenor and move the line from the C-sharp at the beginning of 82 to the D-sharp, E-natural, F-sharp, G-sharp and follow that line right up. It is necessary to leap, to pull back and build. He pulls back and builds, pulls back and builds, until he is back in tempo at measure 87. Woodward recognizes the tenor line as the critical one which must be maintained and articulated. He sees this as the reason Xenakis notates this passage on four staves, so that the performer may see the movement and the direction of the individual voices, a visual presentation which is impossible to delineate when written in a chordal reduction. That, Woodward contends, is the reason that a reduction is a trap. That is also the reason that Woodward works with three or four working scores simultaneously, with the composer's original score affixed to the wall, always within easy eyesight.

Concerning measures 81 and 82, Woodward speaks of the example of Arthur Schnabel, "who could barely stretch an octave and yet played those big trills and double octaves in the Brahms concertos, God knows how. There's a wonderful thing Schnabel said with his little hand, as he was grappling with

---

[99] Interview, January 3, 1996.

those octaves: 'There's no such thing as a technical problem, there are only musical problems.'"[100] So Woodward responds to Hill's first example by discussing the technical problem in measure 82 in the musical context of the preceding measures: he sees what happens in measure 82 as a direct result of what happens in measure 80. What Takahashi indicated but did not articulate in his phrase, "the performer also has ears," is the necessity to hear and to play the tenor line as it rises. If the tempo must be slowed to articulate the rising line, Woodward's advice is to slow the tempo.

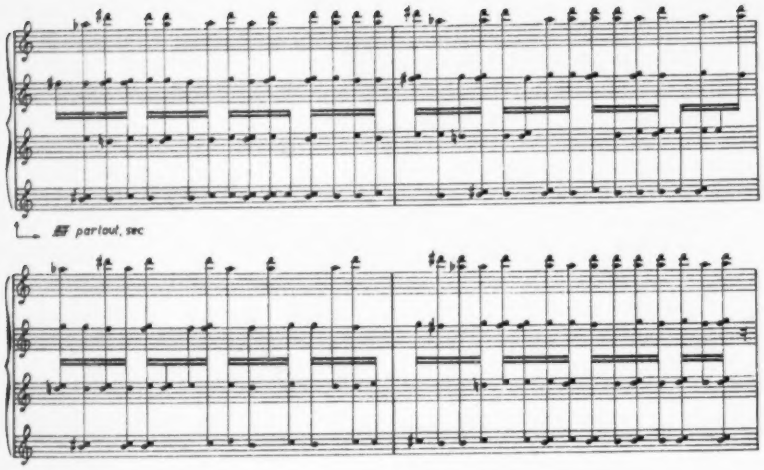
Claude Helffer's approach to measures 81 to 83 is different, primarily because of his goal to sustain the tempo. Without slowing the tempo he finds it necessary to suppress the odd note, particularly if that note is repeated. In principle his idea is to preserve the integrity of the lines and *to create the impression that he is playing everything*. It was a humbling experience to hear from such an eminent pianist, "Perhaps some can play more than I can play."[101]

Bucquet contends that the phrase at measures 61 to 64, which encompasses Peter Hill's Example 5, is one of the most rigorous passages in *Evryali* (Example 12).

---

[100] Interview, January 3, 1996.

[101] Interview, December 18, 1995.

EXAMPLE 12

This stochastic passage Bucquet considers "diabolical" because the variation among the pitches is different in each instance. Measures 61 to 64 are based on the mathematical construction or calculation of variations among the eight notes, therefore this phrase cannot be grasped by immediate sensitivity to the music, nor can it be memorized by the ear: "This passage I consider one of the most difficult, not because of the jumps, but because this has a law and the law which governs these four bars escapes the feelings of a pianist. A pianist is not trained to understand what stochastic music is."[102] Hill's article cites this passage as difficult to learn for the same reason as noted by Bucquet:

---

[102] Interview, December 15, 1995.

"There are no chains of repeated note-to-note relationships."[103] Hill's solution is as follows:

> There seem to be two alternatives to playing what is written, but neither is satisfactory. The first is to organize the notes by inventing repeated orderings, and disguise the patterning by changing the system as frequently as possible, say every minim. Clearly, if such patterning were to be perceived by the listener, the musical intention of randomness would be lost. The second is to read the passage like a 'graphic' score, improvising an impression of the changing densities. Such a performance, besides being an admission of defeat, could never produce the *detailed effect* of chance.[104]

Bucquet's solution leaves nothing to chance. Her advice is first to learn the top line, then the next line and then, finally, to integrate the left hand. Her analogy is to bring together the various components in the same way in which an orchestra brings together various instruments. Bucquet insists that this passage be rigorously prepared because it cannot be performed "by ear": "You have to be *so* controlled and so at home with it; you must establish the possibility of reflexive conservation, that it has been stored right and it should come out."[105] Here again, the pianist is encouraged to establish a geographical acquaintance with groupings and patterns, among the pitches as well as the rhythms. In an article entitled "Dompter la mer sauvage: réflexions sur *Evryali* de Iannis Xenakis," Marc Couroux suggests a method,

---

[103] Hill, 22.

[104] Hill, 22.

[105] Interview, December 15, 1995.

also based on patterns, for trying to commit this passage to memory.[106] Of course, it would be so much easier to play this passage as chords, but here Xenakis did not write chords, he wrote swelling lines. Again, this is one of the reasons why Bucquet objects to reducing the score to a chordal presentation, because "Xenakis does not like the idea of chords and he does not like the idea of clusters."[107]

Bucquet also employs a technique, apparently devised by Pierre Boulez, which she refers to as "recitation." It is not singing but rather a way of uttering pitches in monosyllabic chant, such as da, di, sounding out duration, rhythm and dynamics; in this way, the music should become completely internalized. With continuity at stake, especially in a passage such as measures 61 to 64, it is very important to master the numbers of notes, the patterns of succession and the duration of the successions. For Bucquet this method guarantees continuity, and it imparts security, a high degree of control and the capacity to go on: "I come to know that whole series of events and I have it in my inner self, without the help of the fingers. Of course, you know there are twelve or sixteen notes, but you must be able to play them without having to count."[108] The recitation technique is also useful for identifying and training for those important moments when the pianist needs to breathe,

---

[106] Marc Couroux, "Dompter la mer sauvage: réflexions sur *Evryali* de Iannis Xenakis," *Circuit*, 5 (1994), 2, 64-65.

[107] Interview, December 20, 1995.

[108] Interview, December 20, 1995.

so that a certain distance may be aimed for and traversed without a breathing problem.

Woodward acknowledges that the microchanges in measures 61 to 64 are a challenge: "In the end you can't play that with your ear or your head. You can get the feel only after many hours of practice, like 2,500 or however many times you practise this passage but, in the end you rely on your callisthenic memory."[109] His approach is to take what is common to the majority of the variations and to assign certain fingers to certain notes; for example, the fifth finger of the left hand stays on the B. Bucquet suggests that when playing *ostinati,* the pianist must first of all be aware of how many notes are involved in the passage and then, reflecting Woodward's view, she says that the fingers should remain "riveted" to the piano keys.

Considering Hill's, Bucquet's and Woodward's judgements that the stochastic *ostinati* sections are beyond the scope of a pianist's ear-training, it is difficult to account for Yuji Takahashi's assertion that listening to the music "guides the performer *throughout* (italics, mine) the performance." Although it is conjectural, perhaps he means that the pianist ought to listen for whatever order has been established and identified by patterns? Nonetheless, the patterns in measures 61 to 64 are extremely obscure.

The next set of blocks which begins at measure 69 has only six notes, but it is treated more rhythmically. For Bucquet, this passage does not signal

---

[109] Interview, January 3, 1996.

the same rigorous exercise required for measures 61 to 64. It involves the same physicality, but the exchange between notes is much smaller, the passage is more rhythmical, and it is easier to execute. This is why Bucquet suggests that measures 61 to 64 may be the best starting-point at which the pianist could begin work in earnest. She advocates investigation first of the opening four-measure phrase, then of measures 40 to 46, then of measures 61 to 64. Her opinion may sound ruthless: "If the pianist cannot manage measures 61 to 64, mentally or nervously, he should give up the piece. On the other hand, once a pianist has dealt with the problem in measures 61 to 64, if that phrase can be securely acquired, then the other stochastic passages are not difficult."[110]

In her inimitably charming way Madame Bucquet tells a story which provides a wonderful analogy for the technical problem of mastering the blocks:

> I know a young man in New York who makes money by walking dogs. He started walking six dogs at a time and now, with experience, he can walk seven or even eight dogs. It is exactly like playing Xenakis: the leads never intertwine. Of course, it depends on the quality of the dogs and the quality of the master. And for me it's exactly like this: you can walk six dogs, you can walk eight dogs.[111]

Woodward sums up the same idea with business-like precision: "The

---

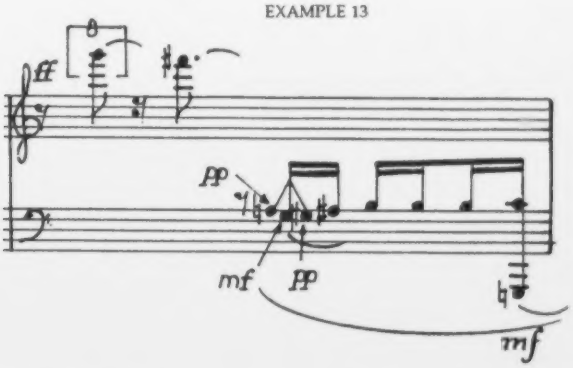
[110] Interview, December 15, 1995.

[111] Interview December 15, 1995.

horizontal process is a purely worldly necessity to master the technical demands of the piece, which are of Olympian proportions."[112] The concept of finger independence is critical to *Evryali* as well as to other Xenakian piano pieces, as the example from *Synaphai* illustrates. This aspect is so important to Woodward that, to maintain finger independence and to be always at the ready for Xenakis's music, he plays the Chopin *Études* and Bach's *Preludes and Fugues* as part of his daily regimen. This "practice" repertoire keeps the pianist sharpened to the necessity, the particular feel, of articulating individual voices with particular fingers.

The technique of finger independence is particularly important when different pitches sounded simultaneously have individual dynamics, as, for example, in measure 158 (Example 13).

EXAMPLE 13



Once again, this is why the arrangement on several staves is actually beneficial for the pianist, because it means that sometimes each finger has its own staff. Bucquet contends that, for reliability, it is a natural advantage that the hand

---

[112] Interview, January 3, 1996.

possesses a kind of physical line for each finger, so that the fingers remain in position on repeated notes. She asserts that this is essential in the fixed passages, the *ostinati*, where the music remains on the same ground, all the while pounding out the percussive exchange.

It is surprising that Peter Hill's article does not mention measure 135, in Woodward's view the most difficult measure in *Evryali*:

> The most difficult of all is that big central slab which goes through from bar 124 with the great difficulty at 135, which I have split so that I can read well enough to jump. Measure 135 is written in such a way that it's hard to negotiate; I've spread it into the callisthenic memory.[113]

Woodward continues with his explanation of the callisthenic memory:

> When I pick up a glass, the callisthenic memory is telling my hand to form a certain shape to pick up the glass; that's the signal the computer is telling the hand to make for 'glass.' In order to pick up these notes in measure 135, the finger patterns you are making are in the computer of the mind and the computer tells your hand to make a certain shape. This memory is incredible and you have to trust it. That's central. The shapes of measure 135 are such that you must move the eye and not permit yourself to think, "I can't." You see, if you look at that, the eye may possibly tell you, "I can't." I prefer the eye to tell me, "You can," so in my working notes I see it like this in order to play exactly what Xenakis has written. What I write in my working notes has to be accessible. And I've written a note here: Remember, the left hand fifth finger comes up here which is the basis and the right hand thumb here, and together they provide the necessary sense of direction. Ultimately, then, the fingers have memory. In this way the spread of the chords--the

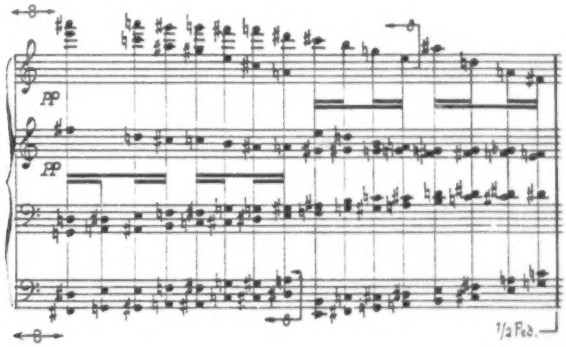
---

[113] Interview, January 3, 1996.

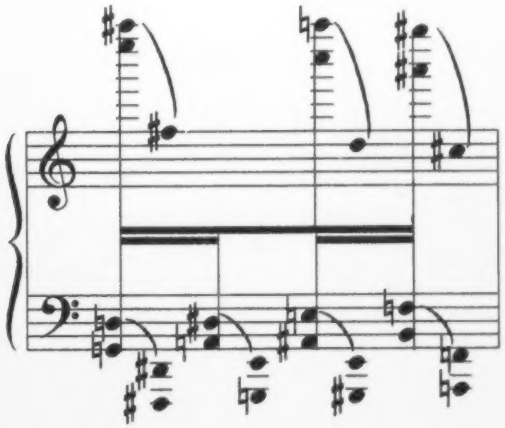
> spread--goes into the callisthenic memory correctly. In a concert the callisthenics will take over, directing the fingers. Arthur Schnabel stood on his head callisthenically. But the sound that came out was perfectly agreeable for me. So, you see, that's our job.[114]

In the score measure 135 appears as shown in Example 14.

EXAMPLE 14



In his working notes Woodward notates the first beat of measure 135 as shown in Example 15.

EXAMPLE 15

[114] Interview, January 3, 1996.

Woodward treats the section from measures 124 to 135 in a fashion similar to the way he treats measures 80 to 87. Reiterating that the tempo is given as ♩= Approximately 60 mm., he slows up in this central part of the work:

> You cannot keep up 60 and sometimes at 135 it grinds to a halt; that's why I say it is very difficult. But, if it takes more time to master some of the difficulties it simply means, take more time. You cannot do more with two hands. Don't go for this idea of another "Xenakis toccata." If you come to terms with bar 135 at tempo, you can come to terms with any of the other difficulties.[115]

Woodward sees grappling with the physical difficulties in the context of the metaphor of coming to terms with "the slaying of the Gorgon," that the pianist is called upon to do battle and adds that, "Xenakis, like Beethoven, loves 'the impossible' and the idea of battling, of extending yourself, of trying to transcend some great physical problem."[116]

Of measures 134 to 135 Bucquet exclaims, "It's like jumping between rocks!" Although she has worked fervently on incorporating all the pitches as written, with leaps similar to Woodward's, she cannot do it; she said that she was defeated on the stage. Therefore, she has her landmarks and chooses to privilege the contrast in dynamics. When asked why Xenakis would write music like this, that is so relentlessly demanding, she responded without hesitation, "It's like architecture: he had a master-plan and he filled in the

---

[115] Interview, January 3, 1996.

[116] Interview, January 3, 1996.

details."[117]

Three major silences of twelve, six and ten seconds occur at measures 65, 189 and 219. These are remarkable moments in *Evryali*: they hold the listener in breathless suspense while anticipating the music's next move. This is one of the reasons why the ending is so dramatically effective. Because the piece is punctuated by three unexpected, pregnant silences, the listener *hears* the ending as another silence and *expects* the piece to continue.

The silences have perforce another significance for the performer, who knows exactly where they occur. Each performer views and "plays" the silences somewhat differently. Marie-Françoise Bucquet refers to the silences as, literally, abysmal moments, major holes in the music which possess the quality of the abyss, a bottomless depth. She suggests two possible directional functions for these silences. One function may be to gather more strength for the journey ahead: "These three major *gouffres* may be the gesture of a sportsman, because Xenakis very often thinks and speaks of the spirit of Olympia which is very close to his upbringing and cultural background."[118] The other function may be to look back on the journey from a certain vantage point. Nonetheless, when she is at the piano she finds herself unable to look backwards or forwards. She is held motionless, like Andromeda, chained to the rock.

---

[117] Interview, December 20, 1995.

[118] Interview, December 15, 1995.

For Claude Helffer, the significance of the silences is as follows:

> Before something important happens there is a long silence, as in Bruckner's symphonies. It is important to play the silences. I try to keep my concentration . . . held suspended, rather like a dog ready to pounce. I try to have the silences timed exactly, but more is better than less. It is very important to think. You must count the silences and for this you need self-control, you must keep yourself contained. You can't count the silences 1, 2, 3 . . . but rather, 1 *and* 2 *and* 3 and so on.[119]

Roger Woodward refers to the silences as "oases, teeming with life, in this wonderful soundscape." A conversation with him on the subject of the silences was revealing:

Arsenault: Do you play the silences?
Woodward: Absolutely. As in *Kraanerg*, they are like great blocks of the unknown. Everything stops but continues full pelt.
Arsenault: Are you held suspended in some way?
Woodward: That is a very interesting question you have asked. When you have a silence in Beethoven, the music continues and you have to clear the musical air, but there is silence. Here, you are left hanging in mid-air, floating in the unknown. They are busy moments.
Arsenault: Do the silences hold you suspended in a kind of a trance?
Woodward: Yes. That's a very good way to describe it.
Arsenault: Do you think the silences are the most dramatic parts of the whole piece?
Woodward: No, but they are fabulous punctuations, like the ends of chapters, in which we momentarily become observers of our own fate whilst in combat with herculean forces of massive energy. But I don't think they have much to do with the formal design, which makes them even more interesting. It is as if a terrible collision of events from entirely separate dimensions in time takes place as the huge slabs of the work's organic life inevitably led to this point. The gargantuan coda follows as a matter of necessity, scuplted from the very hands of nature herself, from which the work was hewn, to enshroud the final meaning of its existence

---

[119] Interview, December 18, 1995.

behind huge veils--the enigma remaining concealed, inaccessible once more.

Arsenault: What is the meaning of the silence at the end of the piece?

Woodward: Have a bath, shower and then comb your hair! Breathe, literally, breathe, to renourish the brain with oxygen, and then play the coda. It's quite a separate part of the work, more than you would expect. He draws a thin veil over the piece and keeps you guessing.[120]

Helffer's view of the importance of the opposition between the dynamics has been cited in Chapter III. Bucquet concurs with Helffer, to the extent that she privileges the dynamics in certain areas above hitting the right notes, or hitting all the notes. Woodward also emphasizes the necessity in performance to present the dynamic parameters as widely apart as possible. In this regard, he claims that one of the most challenging elements in Xenakis's work and one that is very often missing in performance is *delicacy*: "The very brutal aspects, the slaying of the Gorgon is one thing, but this very delicate dance-like sonority [measures 70 to 74], to get the delicate sounds as he wants them, as the Greeks dance, is another . . . ."[121] Woodward is at pains to point out that blocks played at the very top of the piano must be contrasted with sections such as "the slaying of the Gorgon," which is played at the bottom of the piano, where the long strings are.

Apart from the technical demands of coming to terms with the music itself, how do pianists prepare themselves to perform *Evryali*? With the exception of saying that he did not "work out" or select a particular diet,

---

[120] Interview, January 3, 1996.

[121] Interview, January 3, 1996.

Claude Helffer did not offer any further illumination on this topic. Roger Woodward, on the other hand, contends that, at the outset he must rid himself of all distractions in his mind and therefore in his life. He then has a definite agenda:

> I must have the house absolutely clean and tidy. I cut down on eating. No sweets. I really have to force myself into the idea of fitness because it is combat, a marathon and the idea of achieving an Olympic feat. There are passages like bars 135 and 136 which have to be precisely negotiated physically. There must be enough weight behind the sound. To prepare yourself so that the performance is sincere, as with any major task, it has to be done within planned divisions of time and you must set the time aside. *Evryali* is not a "normal" piece. Neither are the demands of Beethoven's *Opus 106*. Many great works of art-music necessitate setting aside time from all worldly distractions. I actually take the phone off the hook for weeks. I don't take any calls and I do not receive people in that time. I do not see people when I'm working on his music. It is an exceptional matter with him; it is the same with late Beethoven and also with Bach, who is closer to this spirit which writes music capable of straddling epochs.[122]

Marie-Françoise Bucquet and Claude Helffer are in demand as teachers and both teach on an on-going basis at the Paris Conservatory and conduct master classes in Europe and North America. Roger Woodward is quite different. When he does take a student--"one student at a time, approximately every five or seven years"--his method is exceptionally concentrated and demanding; by comparison Madame Souzatska's students may well consider

---

[122] Interview, January 3, 1996.

themselves to be on holiday! His pedagogical approach has a general applicability to almost any piece of music, but his elaboration in answer to the query, "How do you teach *Evryali*?" is presented here in its entirety.

Roger Woodward with Xenakis

At the outset Woodward demands that students cease other activities, rent a place nearby and have someone provide for their everyday needs. Financial problems--"they would have to be solved by way of an award or grant"--are not admissible; the student must concentrate solely on the music at hand. Woodward's pedagogical plan is set out in a number of steps, which largely mirror his own extensive, thorough-going preparations for performance.

Step 1: All external distractions such as personal meetings, telephone and car must be cut out in order to ensure there are no disturbances of any kind. Three four-hour shifts of working with the music are ideal. Variations in the shift-time are permitted in the sleep/work pattern, provided that twelve hours of work are achieved each day, in which eight working hours are devoted to physical performance.

Step 2: The score must be read through three times without break or interruption of any kind, in order to hear what it has to say. Questions must be noted and then asked at the end of the third reading. All the formal components in the score must be checked: the measures must be numbered correctly, accidentals observed and the time values verified.

Step 3: The score must be rewritten "from top to bottom." Woodward says that students complain that they do not have the time to rewrite the score, but this is something he insists upon, even if it means starting the day with the rising of the sun. The composer's score is then mounted on the wall.

Step 4: Next follows an external analysis and subdivision of the sections

into working zones for personal convenience. Work then proceeds according to pattern types, such as the rhythmic and stochastic elements. If the pattern types are spread over more than two staves, they have to be redistributed with all the pitches intact. Charts analysing dynamics and the use of the pedal to articulate the dynamics must be made. Work up to this point is entirely analytical and represents, in the main, "getting settled" with the piece.

Step 5: Hand positions must be worked out to get an idea of the distribution of the pitches in the specially-notated areas and all fingerings and body movements must be planned for each section. This process of individual pianistic hand movement requires precise analysis and dedicated rehearsal: there are no short-cuts for the pianist in establishing the *modus operandi*. This is the kind of preliminary work the pianist must undertake in order to become familiar with the topography of *Evryali*.

Step 6: With a mental grasp of the details, the student may now work at the piano. At this stage the callisthenic memory is developed and the muscular co-ordination articulated. Then a second "memory system" is developed, so that two memory systems, one physical and one mental, operate simultaneously. This is the stage in which the love of the work develops and its individual "story" becomes clear to the interpreter. There is always a moment in which the work itself will make clear what it wants from the performer.

Step 7: The last step is the integration of the tempi. The pianist must learn how to move from a fast (=72) to a slower pace (=48) and *vice versa*,

as is necessary, for example, at measure 80, so that by measure 82 an appropriate pace is achieved. According to Woodward, the integration of the tempi is one of the greatest challenges. The journey must be smooth, devoid of all hint of stopping and starting, and this depends on the "the song, the action behind it"; in other words, together with the technical demands, interpretation is a major factor in performance. The details relating to pacing and timing and entry and exit points of the action must be compared to the lyric developments in the piece. For Woodward, the subtlety in *Evryali* consists of the expression of the lyric and motoric features, together with cognizance of the dramatic action.

Step 8: An easy flow must be established by playing the music through in a variety of ways. The goal is to achieve a performance-flow like that of a river.

Working out each day, starting in the early morning, working three shifts of four hours each in an established pattern: Woodward's rigorous prescription for success is not for the lazy, the faint-hearted or the uncommitted. The industriousness and the labour-intensive method he espouses while striving for perfection does not admit of mediocrity of any kind. In his rubric, this is what is required "to slay the Gorgon."

When Bucquet teaches *Evryali* she is adamant that the pianist must, at the outset, be *mentally prepared* by having a *psychological awareness* of what is at stake, namely, the differences between this music and the traditional classical repertoire. Because she believes that many of the technical demands in *Evryali*

lie outside the piano's conventional domain, she advocates a complete readjustment of thinking, a process she refers to as "rites of initiation." For the physical and mental approach, Bucquet recommends Barry Green's book, *The Inner Game of Music*: "That goes for *Evryali* - what he says about how to play really high quality tennis is very important here."[123] Bucquet's insistence on psychological awareness may well derive from her own reaction when she first saw the score of *Evryali*:

> When I first got the piece I was hysterical, and I was afraid; I looked at the score and I was paralysed. When you look at a score for the first time, the first glance, the first interpretation, you always gather all your memories of other scores and it looked to me like some kind of Stravinsky. Then it didn't look at all like Stravinsky . . . .[124]

Furthermore, Bucquet stresses the point that there are events integral to the traditional classical repertoire which are non-existent in this music. For her, there are no periodic phrases with normal built-in tensions and releases which typically give music a kind of direction and to which most musicians and most listeners are accustomed. She says that, "Xenakis's music does not respect that duality. There is no tension and release in the music."[125] Therefore, the signposts are not very clear. Even musical events such as those

---

[123] Interview, December 20, 1995. The reference is to Barry Green with W. Timothy Gallwey, *The Inner Game of Music* (Garden City, New York: Anchor Press/Doubleday, 1986).

[124] Interview, December 20, 1995.

[125] Interview, December 20, 1995.

which occur at measures 146 to 179, are not heard by Bucquet as release:

> It's not really release, it's a kind of photography, taking things from very far away; it's an enlargement of the space and it's another dimension of the inner waves, the wind gives some kind of direction. Suddenly there is a release; it does not have the same role. That is why an interpreter of *Evryali* should be like the director of a play. And the scenario is very complicated because you do not know where you are going to be and why you are going to be there. You must build within yourself a sense of where the music goes and why it goes there. It is very important that you know, especially for the listener, because if you are not very determined on your itinerary, the listener will become lost. And the itinerary can be on several levels. You can travel very near with a lot of impact, a lot of tension and a lot of advance. Lots of things can happen between here and the corner of the road. And I can go six hundred miles and nothing happens.[126]

In undertaking this musical journey Bucquet suggests that the mode of travel, the direction of travel and the distance to aim for are fundamental questions which must be addressed prior to the physical undertaking. Bucquet's initial approach, then, is similar to Woodward's, but hers has a slightly different emphasis, which allows for a more gradual building of psychological awareness in preparing to acquire the physical tools required to overcome the unknown. The goal of this lengthy initiation is to establish what she calls an "optimistic" approach.

To illustrate what is entailed in the "optimism" required of the pianist tackling *Evryali*, Bucquet draws from her own experience in a different musical

---

[126] Interview, December 20, 1995.

idiom:

> I was trained as a Schoenberg player; my teacher was Schoenberg's student. He used to say to us, "When you play this music you must feel in yourself when you have completed the twelve tones. You must have the sense of accomplishment." When he first said it, I thought, "My God, I cannot do that!" And now it's natural. I travel the piece with the twelve heads of state in mind and I've had to train myself by playing that music. It's the same with Xenakis. And if you can make the mental permutations you will be even better off. Helffer can do that, but I cannot.[127]

So it is in Bucquet's teaching: the initial stages at the piano must be preceded by an awareness of the physical anomalies or differences necessitated by the Xenakian idiom: "The image of the hand and the relationship you entertain with your hand must change. You must accept that the ten fingers can send signals, but most of the time they lose their relationship to one another. They should be ten people going through that jungle but they should become totally integrated."[128] This goal of integral design among the ten fingers may be facilitated by practising hands separately, in order to reduce the tension between and the attention to the ten individual members.

And so to the performance itself.

By her own admission, Bucquet states that knowledge of the presence of stochastic elements in *Evryali* did not aid her performance, quite to the contrary. Images of the sea, the tempest, hail and gale-force winds helped her

---

[127] Interview, December 20, 1995.

[128] Interview, December 20, 1995.

to be physically responsive and gave her an awareness of the flow and direction of the music, of knowing how long it takes the music to reach a destination, to establish impetus and flow--*élan*, in her French term.

Two prime concerns for the pianist in performing *Evryali* are the maintaining of physical balance at the piano and knowing when and how to breathe throughout a performance. Woodward suggests that the best way to keep a sense of balance is to sit precisely centred opposite middle C and E-flat, at the lowest possible seat level for optimal utilization of the body's weight. Leaning forward generates more weight, leaning back generates less weight; it is the balancing of the weight of the body which must be transmitted and transformed into weight in the fingertips. The body weight must not thrust down over the keyboard, otherwise the music produced is "ugly and sounds like stones."[129]

On the subject of breathing techniques, Bucquet says, "I don't think about 'breath', I think of *souffle*, 'air'." For Bucquet, breathing should be dissociated from physical gestures: when there are very active, rapid gestures or during the playing of *fortissimo* passages, the breathing should be more controlled, very low and not too active. She advises: "Like singers, pianists must learn when to take more air and when to take very little. And it is not true that when you make a big effort you must take more air or use more air.

---

[129] Interview, January 3, 1996.

Some very great pianists are like fish, they breathe through their noses."[130]

Once awareness and the mental and physical preparations have all come together, Bucquet contends that "in *Evryali* you must train yourself, like an athlete, to do the full trip, to endure the length, to play from the first bar to the last bar, often. You must know how to tame your own energy and how to negotiate all those terrible and very demanding moments and how not to expend too much energy on certain things, and you can only learn that by playing it very often."[131] Woodward contends that it takes about seven years to play a Xenakis piece really well--"and many, many, many performances, live performances." He says, "You've got to play this stuff, you can't talk about it. Think of Hesse when he advises, 'Truth must be lived, not taught. Prepare for battle.' Then substitute the words, 'Playing *Evryali*' for 'Truth.'"[132] Helffer's advice is similar: "Play before knowing it very well. You have to play, play, play." With his eyes dancing with mirth, Helffer says:

> The first public performance will be very bad, so play it first in a small city in the Rockies and not in Toronto or London. Even though it's not perfect, you must try. If you wait until you know it perfectly, you will never play it. Before you jump into the sea, you don't know how to swim, but when you jump in you learn very quickly.[133]

---

[130] Interview, December 20, 1995.

[131] Interview, December 16, 1995.

[132] Interview, January 3, 1996.

[133] Interview, December 18, 1995.

Claude Helffer with Xenakis

The process of constructing a recital programme which is to include *Evryali* is a fascinating element of the performance of the work. Claude Helffer elects to play the Xenakis repertoire at the end of a concert--and for a particular technical reason: "After *Evryali* you can't play anything like a Mozart sonata, because the piano goes out of tune. After Xenakis I play nothing."[134]

Woodward proceeds from an opposite perspective, undeterred by potential tuning problems and preferring to play other piano works of Xenakis in the first half of the programme, together with *Evryali*: "I like *Herma* as a lyric, singing piece, *Evryali* is an onslaught, *Mists* is the architecture, *à r* is the

---

[134] Interview, December 18, 1995.

encore." In the second half, he performs Bach ("I think they are very close and I often programme them together"), late Beethoven sonatas, Debussy (*Préludes*, Book II) or "something more lush which still gives structure."[135]

Bucquet has handled the tuning problem practically: whenever possible, her solution has been to have two pianos on the stage, one for *Evryali* and a piece which she has often played with it, Stockhausen's *Klavierstück XI*: "They are big, big pieces and very tough on the piano." The other piano was for Bach. After the performance of *Evryali*, Bucquet would feel as though she had participated in a wrestling match, within herself, which would rob her of stamina and leave her in a state of hypernervousness, so that a Bach chorale was her preference for following *Evryali* on the programme.

It comes as no surprise to know that neither Bucquet nor Helffer nor Woodward goes on to the stage to perform *Evryali* without the support of a score, and all eschew the services of a page-turner. Notwithstanding this self-reliance, Bucquet recalls a concert in Strasburg during which she and Helffer both played *Evryali*, one after the other, and on that occasion they turned pages for each other:

> And I turned pages without looking at the score; of course, I just did it for the pleasure. And he, too. But it was a gesture for the public. We did that also with a Stockhausen piece. With Helffer there was the desire to hold up a mirror to one another. We presented each other, in a way naked, for comparison. It was interesting because we are so different, we don't have the same background at all,

---

[135] Interview, January 3, 1996.

> furthermore, I'm a woman, he's a man. But also, he's a great mathematician; he's a great brain; he's a very controlled man. And I'm much more impetuous, and so it was interesting for the public.[136]

When it comes to *the* grand moment on the stage, the moment for the performance of *Evryali*, Helffer believes that a pianist "must be very relaxed--not stiff--relaxed and precise."[137] In his expressive, discursive fashion Woodward says, "It's a big journey to make, like an odyssey of some kind. To negotiate the difficulties you've got to have a head, as Richard Strauss said, 'as cool as two slabs of marble.' I have always believed this is the way to play Xenakis."[138] Woodward advises:

> Sit very low on the chair. Be calm. Very calm. Wait until the sounds call you. You must come completely calm and relaxed on stage to play Xenakis, as if you were in your own house. I have come to the conclusion after many years that the stage *is* my house and wherever else I live is a stage prop. When I play Xenakis on the concert platform, I've walked into my house. The best I can do is there. There are various points of view but when you walk on the stage you must know that, "This is the central purpose of my life." It's like Xenakis designing all those clouds of sounds. That's his house, that's where he really is. When I go on stage that's where the direction is for all the training, all the living, all the interaction.[139]

---

[136] Interview, December 20, 1995.

[137] Interview, December 18, 1995.

[138] Interview, January 3, 1996.

[139] Interview, January 3, 1996.

And during that live performance of *Evryali*, what occupies the mind and spirit of the artist? Interestingly, Bucquet captures the moment in another metaphor of the house:

> You are in the fire. When your house is on fire, you react, you take risks. I think there is an element of that turmoil psychosis which you must experience when you play such a piece. You have to build enormous forces and somehow they must then operate by themselves. I don't mean you lose control of yourself. But there is the fact that you go to the limit of your energy, of your physical stamina, and your mental concentration, and that takes you to a certain degree of, maybe not of ecstasy, but of being enraptured, and so focused that you lose sight of everything else.[140]

---

[140] Interview, December 20, 1995.

Conclusion

Close focus on *Evryali* has revealed a composition of opposites and contrarieties: it is based on mathematics and science, yet it bears the stamp of Xenakis's personal experience; it utilizes Twentieth-Century concepts, yet it is tied, culturally and historically, to ancient Greece; it employs formalized and codified compositional techniques and processes, yet these are not necessarily useful for the performer. In short, it would seem that *Evryali* is the natural habitat of both rationality and irrationality.

A focal adjustment, however, away from a concatenation of detail permits the view of *Evryali* as cohesive and ageless, linking epochs. Opposites are seen in harmonious co-existence, contradictions conjoin in a totality: every positive implies a negative, every external implies an internal, every beginning necessitates an end. Roger Woodward addresses the musical totality of *Evryali*: "You have one great shape and then another; it's an occasion, it's an event, it's history."[141]

If one were to superimpose upon one image, shrouded in the mists of time, of those proud Olympians of the first recorded Olympic Games of 776 B.C., another image of the contemporary pianist on the concert stage, the totality of Xenakis's vision could be made more comprehensible. In a very real sense, Xenakis has succeeded in applying the principle of "substitution by

---

[141] Interview, January 3, 1996.

analogy" by transferring the Olympic ideal to the concert stage. In so doing, he has extended the "whole nature of piano technique and piano playing;"[142] he has built and sculpted sounds which challenge the performer to go *beyond* the limits of traditional training and performance practice.

How then, in practical terms, may Xenakis's challenge be met by the performer?

As a first step of prime importance, the performer must assume the mantle of self-reliance. Here Marie-Françoise Bucquet quotes Xenakis tellingly: " 'I wrote the music, now it's yours. I don't care what you do; it's all your responsibility, all yourself.'"[143] Claude Helffer corroborates the view: when examining the physically-difficult passages, Helffer stated that he had discussed Hill's article with Xenakis and that "Xenakis prefers each artist to make his own choice." Helffer also quotes the composer: "'We should not teach a special arrangement. Everyone has to have his own solution.'"[144]

Nonetheless, individual solutions summon the performer to grave, substantial decision-making.

As far as the present study of *Evryali* has been able to determine, at least three alternative performance solutions have been adopted. The first requires a reduction of the technical difficulties in the manner proposed by

---

[142] Interview with Roger Woodward, January 3, 1996.

[143] Interview, December 20, 1995.

[144] Interview, December 18, 1995.

Peter Hill. In this instance, in order to maintain the tempo as the prime compositional element, certain notes are eliminated, so that the hand is always able to encompass all the notes to be played, a concept and practice familiar from the established classical repertoire. The effect of this solution is that as *Evryali* becomes more playable, it also becomes more chordal and may sacrifice what Xenakis has written. However, all three interpreters interviewed were adamant that the piece is non-chordal and that non-pianistic identity must be preserved. Hill's solution would seem, then, to entail too radical an alteration of idiom.

A second solution accords prime performance significance to the pitches: here, the tempo is slowed to accommodate the athletic leaps required by playing all the composer's notes. This is the performance practised by Bucquet and Woodward. The effect of this solution maintains the non-chordal essence of the piece while allowing for variation in the tempo, taking advantage of the allowance in the notation, ♩ = **Approximately 60 mm**. Although this tactic facilitates the playing of all the notes, Woodward, for example, continues to strive to maintain the tempo.

The third solution, adopted by Helffer, is to maintain tempo through the suppression of repeated notes.

In all three solutions one musical element, either pitch or tempo, must be privileged; and in each case, adjustments must be made which another interpreter could consider a distortion of the composition.

The general consensus from the three artists interviewed is that the most

important musical element to preserve is the voice-leading in the continuity of the lines. But, beyond that, the single most important aspect of *Evryali* is for the artist *to have the courage to try*. Background, temperament and training all impel the artist to hew a necessarily private path to the public performance of the piece. Bucquet says of her friend, Helffer: "He is much more moral than I am; he leaves very little to chance. When I played the piece I took a lot of risks and sometimes it worked, how, I don't know. And I think I like to take risks, otherwise I would never have played the piece."[145]

When asked if parts of the score are impossible to play, Roger Woodward's response was an unequivocal "No." To obviate any misunderstanding, the question was then phrased differently: "Do you think this piece can be played one hundred per cent?" Again his response was unequivocal: "Oh, yes. It's just a matter of how much you slow up, being able to get that [measures 80 to 87], to catch that up [measures 124 to 135]. Eventually, I'll catch it up. All I need is time, then there will be no slowing up."[146]

Bucquet stresses that if *Evryali* is played "very flat," all the notes can be physically accomplished, which is one of the reasons why a recording does not interest her: "I believe any performer can record *Evryali*; it can even be recorded with hands separately, and then electronically put together. For me,

---

[145] Interview, December 20, 1995.

[146] Interview, January 3, 1996.

Evryali is a piece which has to be hot and taken alive."[147]

At the same time Bucquet emphasizes that her close contact with Xenakis, sustained over many years, "gives living proof that there is something beyond notes and beyond the daily world." She expands this notion by speculating upon what Xenakis is looking for in his music:

> . . . that moment of vision when you leave the boundaries of rationality and you come to a kind of vision, a moment of grace or destruction--I don't know what it is--when you are out of bounds, like the Greek gods. I think he looks for this moment of fusion, when the soul and the body try to meet. And when you get somewhere there, it's not ecstasy; I don't think he wants the Christian, he wants the pagan version of it. In the relationship which you, the performer, personally establish with what he offers, so that you become a kind of demi-urge--he is really interested in that. That is not always implied in what he writes; he is even frightened of that, but it's really his [world], I mean the metaphysical is in his daily behaviour. And therefore it's in his handling of musical events. It's going beyond the material gesture and the physical gesture. And I think this is what makes people hate Xenakis and love Xenakis.[148]

There are times, Bucquet admits, when all the notes cannot be played but all the notes *must* be learned; the performer must be able, at least once or twice, more often if possible, to play them. She sums up the exigencies of performance with wonderful panache:

> What is interesting is that whenever you sit down to play the piece, you sit down persuaded that you are

---

[147] Interview, December 20, 1995.

[148] Interview, December 20, 1995.

> going to play all the notes. But of course you get out of focus because in the midst of the struggle you lose a bit of your hair, and a little of this, and there some notes go astray. And because the piece consists of logical processes, if you decide that you will play randomly, it doesn't work. You must have in your brain the full conceptual linear and rolling [*élan*] of the piece, otherwise you are dead.[149]

Bucquet has tried to entice musicians into Xenakis's world of sound which is both unusual and uncomfortable but, she says, it takes special people to be interested, to embark on the long, arduous journey of learning Xenakis's works. Ultimately, it is a question of psychological conditioning and fortitude:

> You must have this yearning within yourself to go beyond the walls. You see, you cannot teach a Xenakis work the way you teach a Bach fugue or a Brahms intermezzo, because so much is a question of how you dialogue with your inner forces and your inner self. Therefore, a teacher cannot say "Oh, you are not brave enough;" or "You are not daring enough;" or "You don't have enough guts;" or "You don't have enough stamina;" or "You don't have enough passion." My teacher says very often, "Tell your students it's a question of life or death." And I am sure for Xenakis that works, it's a question of life or death.[150]

Of the performance of *Evryali*, that Olympic contest in a public forum, Woodward captures the impulsion of the trial and the conquest:

> It's a grand occasion. It's a musical occasion. *Evryali* should be played with a sense of occasion; you are going to slay the Gorgon. That's not easy. Frankly, you must be prepared to stand on your head and play with your toes if you have to, so long

---

[149] Interview, December 20, 1995.

[150] Interview, December 20, 1995.

as you are ready for combat and really deliver the most wonderful, inspired performance. Furthermore, a sincere artist does not talk about difficulty. A great artist, a truly great artist, like Arthur Rubinstein, for example, would play the most difficult things in such a way that you would believe, "I think I could do that." The old-fashioned way artists had of presenting heroic music was to conceal the difficulty and always give the impression things were more accessible than they were. The harder they were and the more accessible they seemed, the greater the artist. Don't think about the difficulty. Everything is difficult. To walk down this street and be alive at the other end is an act of heroism. Be brave. Great art, of necessity, is difficult--it always was. Beware the artist who talks about difficulty, beware him. Come, now, let's listen to *Evryali* . . . .[151]

---

[151] Interview, January 3, 1996.

Works Consulted

Literature

Bent, Ian. *Analysis*. New York: Norton, 1987.

Berry, Wallace. *Musical Structure and Performance*. New Haven: Yale University Press, 1989.

----------. *Structural Functions in Music*. New York: Dover, 1987.

Bucquet, Marie-Françoise. "Sur *Evryali*." *Regards sur Iannis Xenakis*. Ed. Hugues Gerhards. Paris: Éditions Stock, 1981, 219-26.

----------. Personal interviews, December 15, 16, 20, 1995.

Couraud, Marcel. "Des *Cinq Rechants* de Messiaen (1948) à *Nuits* de Xenakis (1968)." *Regards sur Iannis Xenakis*. Ed. Hugues Gerhards. Paris: Éditions Stock, 1981, 186-93.

Couroux, Marc. "Dompter la mer sauvage: réflexions sur *Evryali* de Iannis Xenakis." *Circuit*, 5 (1994) 2, 55-67.

Cusick, Suzanne G. "Gender and the Cultural Work of a Classical Music Performance." *Repercussions*, Spring (1994), 77-110.

Fleuret, Maurice. "Xenakis: A Music for the Future." *Music and Musicians*, 20 (1972), 20-27.

Green, Barry with W. Timothy Gallwey. *The Inner Game of Music*. Garden City, New York: Anchor Press/Doubleday, 1986.

Griffiths, Paul. *Modern Music*. London: Dent, 1981.

Helffer, Claude. "Sur *Herma* et autres." *Regards sur Iannis Xenakis*. Ed. Hugues Gerhards. Paris: Éditions Stock, 1981, 195-205.

----------. Personal interview, December 18, 1995.

----------. Letter dated March 26, 1996.

Mâche, F.-B.. "The Hellenism of Xenakis." *Contemporary Music Review*, 8 (1993), 197-211.

Matossian, Nouritza. *Xenakis.* London: Kahn & Averill, 1986.

Moncrieff, A.R Hope. *Classical Mythology.* London: Senate, 1994.

Morgan, Robert P. *Twentieth-Century Music.* New York: Norton, 1991.

Philippot, Michel. "Xenakis." *The New Grove Dictionary of Music and Musicians.* Ed. Stanley Sadie. London: Macmillan, 1980. Vol. 20, 559-561.

Woodward, Roger. Personal interview, January 3, 1996.

---------. Letter dated April 1, 1996.

Xenakis, Iannis. *Arts/Sciences: Alloys. The Thesis Defense of Iannis Xenakis.* New York: Pendragon Press, 1985.

---------. *Formalized Music: Thought and Mathematics in Composition.* Stuyvesant, N.Y.: Pendragon Press, 1992.

---------. *Formalized Music: Thought and Mathematics in Composition.* Bloomington: Indiana University Press, 1971.

Yoken, David. ""Interview with Xenakis on Performance of *Psappha.*" *Percussive Notes,* 28 (1990), 53-57.

Musical Scores

Xenakis, Iannis. *à r. (hommage à Maurice Ravel).* Paris: Salabert, 1987.

---------. *Eonta.* London: Boosey & Hawkes, 1967.

---------. *Evryali.* Paris: Salabert, 1981.

---------. *Herma.* London: Boosey & Hawkes, 1967.

---------. *Metastaseis.* London: Boosey & Hawkes, 1954.

---------. *Mists.* Paris: Salabert, 1981.

---------. *Nuits.* Paris: Salabert, 1968.

----------. *Pithoprakta.* London: Boosey & Hawkes, 1967.

----------. *Synaphaï.* Paris: Salabert, 1969.

Recordings

Xenakis, Iannis. *Evryali.* Performance by Yuji Takahashi. Japan: Denon,1986.

----------. *Evryali.* Performance by Claude Helffer. Paris: Disques Montaigne AuVidis, 1992.

----------. *Evryali.* Live performance by Yuji Takahashi. Audiocassette, n.d..

----------. *Evryali.* Live performance by Roger Woodward. Audiocassette, 1993.

pp

½ Ped

ff (partout)

pp

½ Ped

legato

stacc

(pp)

(mf)

ff

Ped ½

pp

½ Ped

mf

(mf)

pp

ff

Ped ½

pp

Ped →

fff

(pp)

(ff)

Ped ½

Ped ½

pp

Ped →

Ped ½

pp

Ped →

ff

pp

Ped ½

(ff)

pp

pp

pp

½ Ped →